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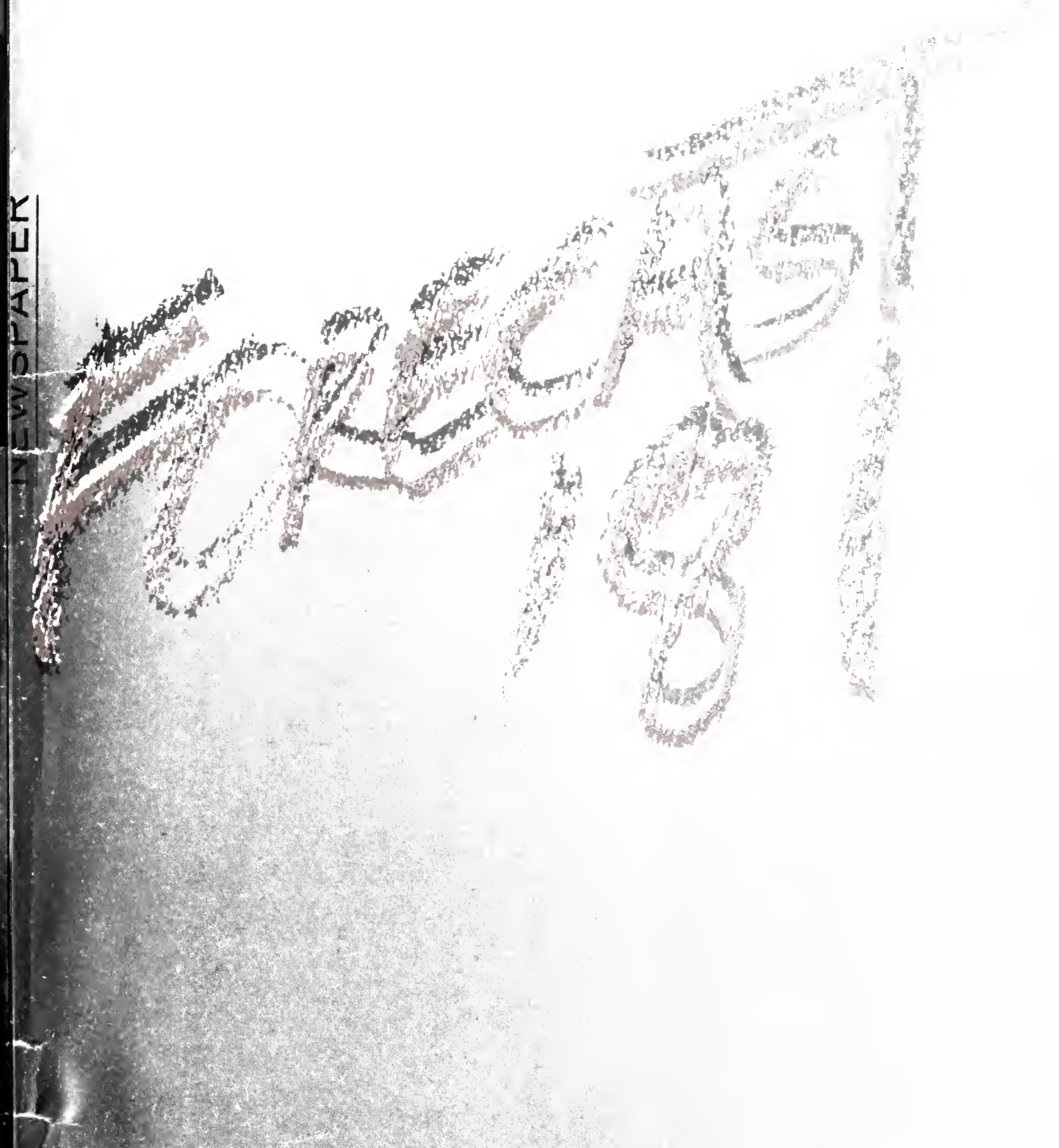

WHAT'S AHEAD:
[illegible] Spending, Personal [illegible]
Software Protection, Local [illegible]

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ABP

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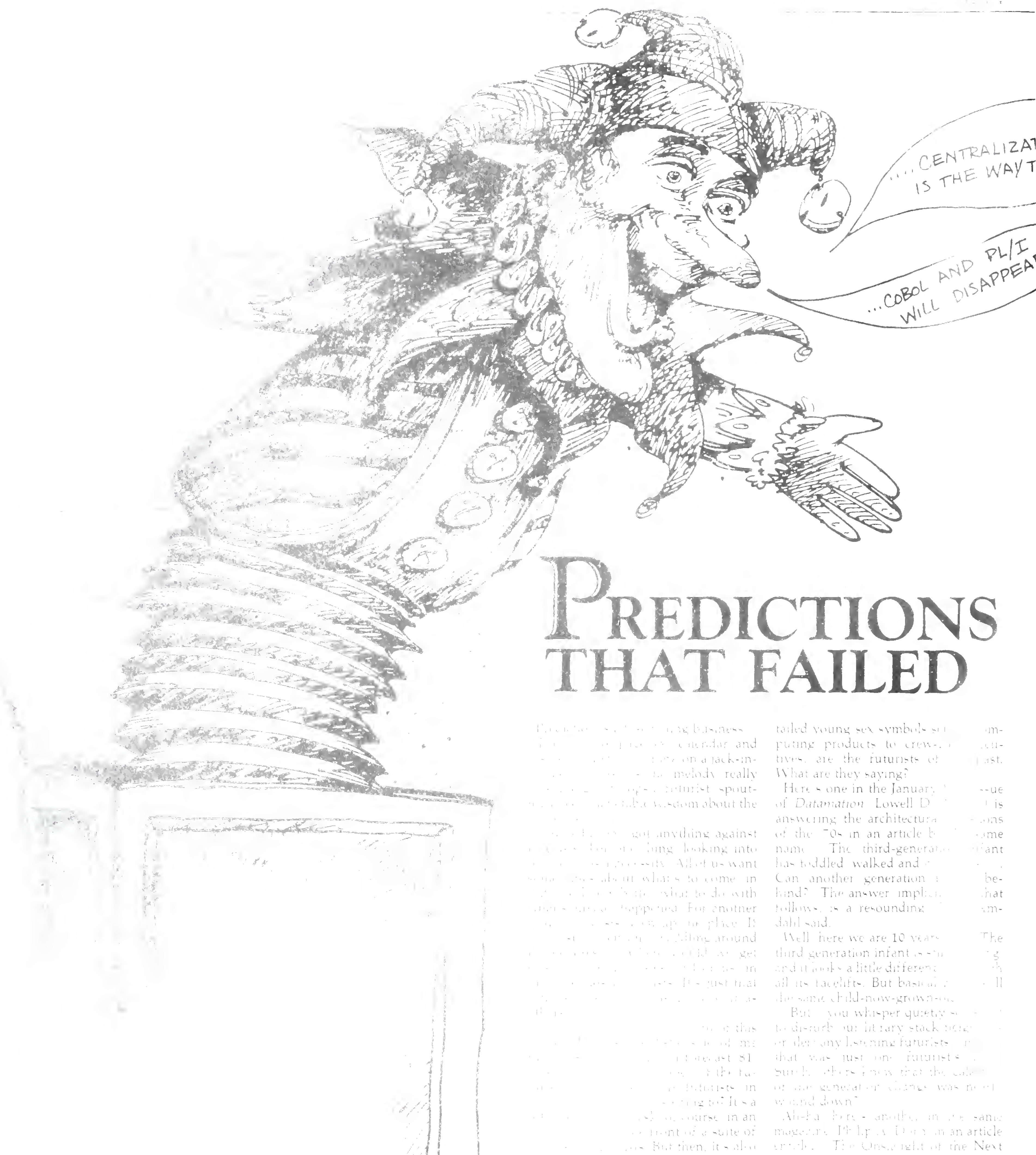

...CENTRALIZAT[illegible] IS THE WAY T[illegible]
...COBOL AND PL/I WILL DISAPPEA[illegible]

PREDICTIONS THAT FAILED

P[illegible] business [illegible] calendar and [illegible] on a jack-in-[illegible] melody really [illegible] futurist spout-[illegible] wisdom about the [illegible]

[illegible] got anything against [illegible] looking into [illegible] curiosity. All of us want [illegible] about what's to come in [illegible] what to do with [illegible] happened. For another [illegible] up the place. It [illegible] around [illegible] get [illegible] in [illegible] It's just that [illegible]

[illegible] this [illegible] me [illegible] forecast 81 [illegible] the fu-[illegible] futurists in [illegible] to? It's a [illegible] course, in an [illegible] front of a suite of [illegible] But then, it's also [illegible] question to ask.

[illegible] if you will into the [illegible] the past. Sh! [illegible] our surrounding futur-[illegible] up to. Quietly, quiet-[illegible] swiftly over to the dust[illegible] periodicals of yesteryear [illegible] the pages ripe with [illegible]

tailed young sex symbols s[illegible] computing products to crew-[illegible] tives, are the futurists of [illegible] past. What are they saying?

Here's one in the January [illegible] issue of *Datamation*. Lowell D[illegible] is answering the architectura[illegible] of the 70s in an article b[illegible] name. "The third-generati[illegible] infant has toddled, walked and [illegible] Can another generation [illegible] behind?" The answer, impli[illegible] that follows, is a resounding [illegible] Amdahl said.

Well, here we are 10 years [illegible] The third generation infant is st[illegible] and it looks a little differen[illegible] all its facelifts. But basical[illegible] the same child-now-grown-[illegible]

But [illegible] you whisper quietly [illegible] to disturb our library stack [illegible] or alert any listening futurists [illegible] that was just one futurist's [illegible] Surely others knew that the [illegible] of the generation change was [illegible] wound down?

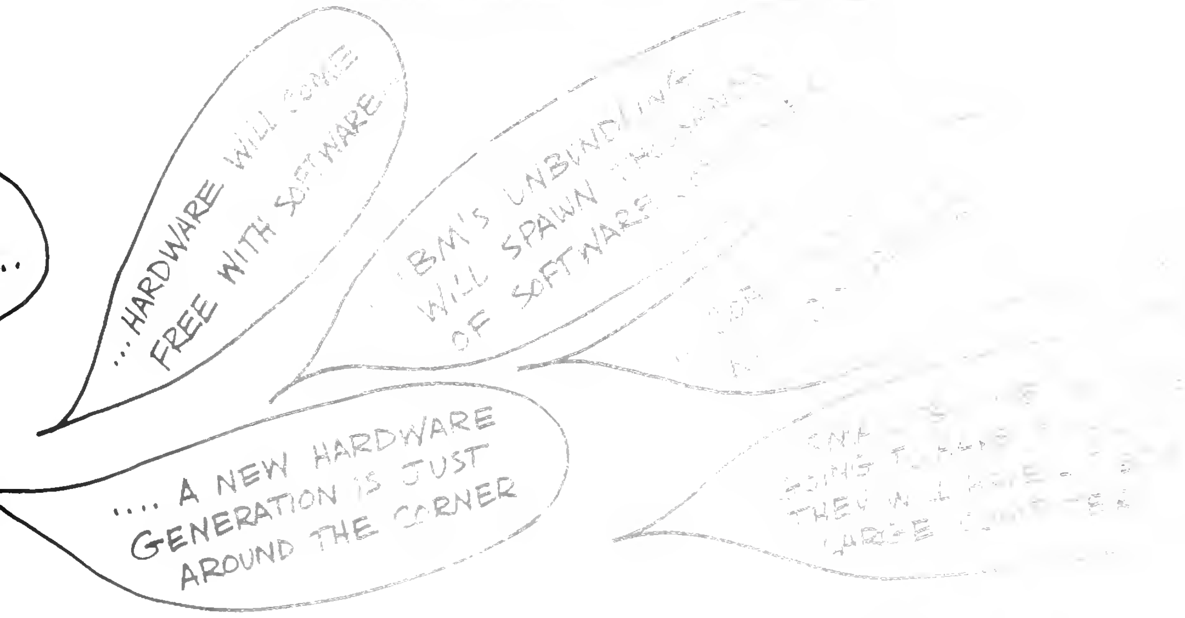
Ah-ha! Here's another in the same magazine. Philip [illegible] in an article entitled "The Onslaught of the Next Generation" is saying, "Let's predict [illegible] generation will be along soon th[illegible] will be incompatible, that the [illegible] will snap it up, that the errors [illegible] will be repeated and magnified [illegible] that you read it here first."

[illegible] gets worse, not better. Now [illegible] futurists are fighting to be first [illegible] wrong! At least on major is[illegible] new computing generations, th[illegible] ists were as good as out to lun[illegible]

Well, then, what about dis[illegible] processing as seen from the pa[illegible] you

---

[illegible] 25-year computing veteran [illegible] author of several books and a [illegible] contributor.


... HARDWARE WILL COME FREE WITH SOFTWARE...
IBM'S UNBUNDLING WILL SPAWN [illegible] OF SOFTWARE [illegible]
.... A NEW HARDWARE GENERATION IS JUST AROUND THE CORNER
THEY WILL HAVE [illegible] LARGE [illegible]

By Robert L. Glass

ask, in hushed [illegible] turists saw that [illegible] question Let [illegible]

Here, in [illegible] smelling [illegible] has an answer [illegible] there would [illegible] tendency toward [illegible] large corporat[illegible] evasive, you [illegible] "seem to be [illegible] user"? Well [illegible] When it com[illegible] computing [illegible] swinging [illegible] of large [illegible] mon It [illegible] cle entitled [illegible] Computers [illegible] the July 19[illegible]

That one [illegible] ists have com[illegible] wrong side of [illegible] ing fence

Moving right alo[illegible] look at software [illegible] and we're just [illegible] from third-gener[illegible] software unbundl[illegible] Remember unbundling? In the [illegible] puting all software came free [illegible] the hardware. ("Free" is in quotes because it was often true that the more expensive hardware just happened to have more software with it than the cheaper hardware.)

Then, late in the 1960s some of the hardware companies came to the far-sighted conclusion that software cost too much to give away and they began charging for it separately, unbundling the cost out of the total hardware price. It was about this time that software entrepreneurs began salivating heavily, fantasizing the potential profits right around the unbundled corner. In the midst of this anticipation, a futurist of the '70s predicted

(Continued on Page 6)

You can talk prog[illegible] all you want, but [illegible] if you don't speak the [illegible]

Introducing CPC. The [illegible]

I want to learn more about

NAME
TITLE
COMPANY
PHONE

[illegible] the trouble [illegible] 1970s [illegible] decision makers [illegible] Computer Decisions magazine [illegible] interviewees seems to [illegible] making a pre- [illegible] what he wishes [illegible] as a whole [illegible] of futurist the kind of [illegible] predicting can make it so [illegible] did these attempts at [illegible] prophecy predict? Try these [illegible]

- [illegible] computers. William Ben- [illegible] January 1970 issue of *Computer Decisions* magazine said [illegible] businesses are not going to [illegible] computers. It's not a practi- [illegible] Small companies are go- [illegible] of a large computer.
- On the people problem: "As the [illegible] and the pool of competent, experienced people expands [illegible] employers will have more candidates to choose from and [illegible] professionals [illegible] will have fewer opportunities." That bit of rare insight was expressed by Myron E. Parr and appeared in the March 1970 issue of *Computer Decisions*.
- On programming languages: "I believe that a major change to come on the part of users will be a shift away from both Cobol and PL/1 [illegible] The computer world keeps talking about Cobol as if they knew what they were talking about. But in the final analysis, it just won't work [illegible] is hopeless." Peter Harris expressed those views on the subject [illegible] March 1970 issue.
- On service bureaus: Chester Young, in the same series, [illegible] quoted as saying: "Service bureaus [illegible] in for some major changes [illegible] most profound change will be a potential abandonment of dedicated in-house facilities by many companies."

Talk about out to lunch! These futurists missed the boat on such items as the microcomputer revolution, the ever-worsening programmer shortage, the ubiquitousness of Cobol (it's still number 1 on the programmers-who-use-it hit parade) and the role of the in-house computer. That's a pretty good grand slam of failed futurism!

Perhaps it's unfair to focus on predictions made in popular trade journals. Have the serious scientific publications had something more accurate to say?

Over here, on this other set of shelves, are some prestigious journals. For openers, there just aren't any blatant predictions here. Look at this end-of-the-decade 1960 issue. There's stuff on sorting and character sets, but nothing on what the sorts [illegible] of the late '60s might look like.

1970s-Era Forecasts

For balance, let's look [illegible] '70s. If the popular journals were looking forward to fourth-generation hardware, centralized computers [illegible] software package proliferation, what were the serious journals saying?

Here's a computer science article on management information systems (MIS). Ah, the MIStique of the beginnings of the MIS era. [illegible] it turned out to be, in many respects, a MIStake. We didn't know as much as we thought we knew [illegible] see, about the information needs and methodologies of running an organization. The promise of the '70s dissolved into the partially successful groping of the '80s.

Were the predictions of the serious scientists of the '60s any better? Let's move down the stacks a decade (a few inches of printed matter) and take a look at some older computer science articles. Ah, here's one on theorem proving. We'll be using computers to [illegible] and derive proofs for tough mathematical or philosophical questions in no time at all — that's the promise of the article. It was a promise to be left unfulfilled.

Maybe the problem here is [illegible] not listening to the real experts [illegible] ones who are computing [illegible] names. Let's do a quick [illegible] quotes by some names [illegible]

Introducing CP/M-86
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[illegible] you need. CP/M-86 is [illegible] to operate with Intel's new [illegible] 8086 and 8088 microprocessors [illegible] the qualities that have [illegible] industry-wide support.

[illegible] MP/M, [illegible] programming [illegible] monitor, [illegible] network oper- [illegible] PL/I, now available [illegible] will soon be [illegible]

[illegible] available on over 250 [illegible] computers. For a closer [illegible] dealer, your manu- [illegible] Digital Research.

[illegible] SOFTWARE ASSOC.

here's Dan McCracken, well-known author and professional society activist. It's about a decade ago, and he's saying that Cobol will no longer be in use by 1980.

And over here, in a tattered issue of *Computerworld* dated June 7, 1972, Herb Grosch, another society activist and professional doubting Thomas, is predicting that by 1980 IBM will be the only computing supplier!

And even IBM itself isn't a very good seer. When IBM was bringing out the 7090, its top management told us that super-fast new device would saturate the market with sales of 30 systems.

Well, with Cobol still the Number 1 language, with IBM competitors flourishing and with a computer in every garage (philosophically speaking), perhaps the real experts [illegible] the unreal.

What to Do?

So, if the popular [illegible] reliable at predicting the [illegible] neither are the [illegible] well-known names [illegible] computer person [illegible] future to do?

One obnoxious [illegible] and read all the [illegible] sue of *Computer*[illegible] measure of doub[illegible] on a shelf to be [illegible] as we just finish[illegible]

But there's another [illegible] cowardly approach [illegible] future. What follows [illegible] tions made pu[illegible] boosting the pred[illegible] may not create [illegible] other futurists [illegible] much more fun [illegible] by the knowledge [illegible] past. So here [illegible] failed futurist tak[illegible] myopic look into the [illegible] future:

- People will continue [illegible] dictions about [illegible] computers. Technical [illegible] continue to carry [illegible] accurate foresight [illegible] come. And, some day, those predictions will come true.
- Computer hardware vendors will continue to be congratulated on the breathtaking drop in the purchase/lease price of their products. People will continue to predict that hardware will soon be given away free with software, a rebundling 10 years after unbundling.
- Hardware improvements for the software builder will be nearly nonexistent. There will be no dramatic improvements in instruction sets or register conventions. The "Fortran machines" and "Cobol machines" of the year ahead will be the same sales-puffed paper tigers they were 10 years ago.
- People will continue to predict that automated generation of software by powerful utility programs is just around the corner. They will continue to be wrong, just as were their very bright colleagues of 10 years ago and 20 years ago.
- Software solutions for distributed systems will continue to be elusive. It is one pr[illegible] [illegible] that the comp[illegible] each other [illegible] software th[illegible]
- Some academ[illegible] base both theory and [illegible] belief that programs [illegible] correct someday. Some [illegible] cialists will ignore proof of correctness [illegible] on the grounds that [illegible] costly and [illegible] prove [illegible] approach.
- Ma[illegible]

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Audit Software: [illegible]

By Vincent C. Rauzino

[illegible]ING BATTLE BETWEEN DATA [illegible]HINES AND [illegible] DATA BASE [illegible]NT SYSTEMS

[illegible] data base machine is defined as a [illegible] DBMS such as Cin[illegible] Systems Inc.'s Total [illegible] Adabas that is [illegible] general [illegible] con[illegible] function [illegible] un[illegible] [illegible] normally [illegible] pre[illegible] ESP.

[illegible] compatible with the IBM 360/370 and 4300 and [illegible] DOS/OS and [illegible] 370 operating systems to [illegible] its hosts in a [illegible] ESP can support 1M to its [illegible] through a channel-to-[illegible] communicating system (CTCS).

[illegible] CTCS consists of a data base [illegible] communication [illegible] (DMCM) which re[illegible] the ESP and a user [illegible] communications [illegible] which re[illegible] help optimize [illegible] transfer rate.

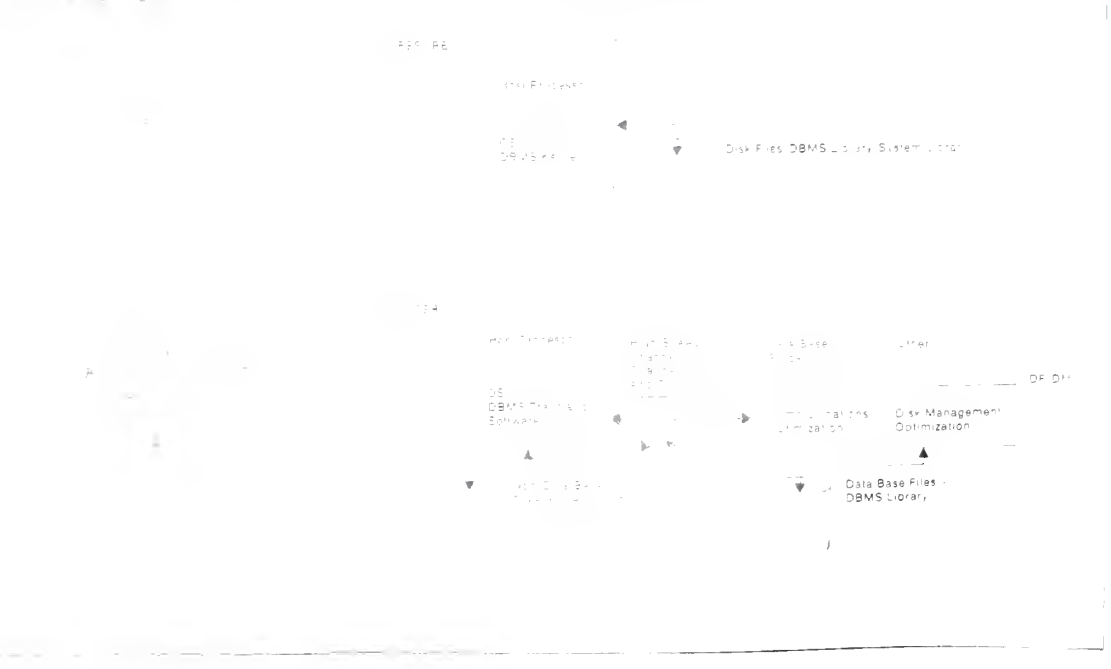
Most of the [illegible] nucleus is off-loaded [illegible] where all updates, deletions, additions and disk management functions are [illegible] independent of the host [illegible] applications programs executing in [illegible] needed portions [illegible] through the CTCS [illegible]. The programs are [illegible] and sent to [illegible] ESP [illegible] data base-related processing. One host can support multiple Adabas machines, and one Adabas machine can support multiple hosts.

Software AG claims that 60% to 70% of Adabas CPU time can be off-loaded [illegible] the host. Tests conducted by the company have reportedly demonstrated a 25% average increase in throughput for an off-loaded Adabas [illegible] a host-resident Adabas [illegible] the same jobs. The purchase price of the Adabas data base machine is approximately $400,000.

An [illegible] dedicated-function [illegible] machine (DF/DM) [illegible] an-

(C[illegible] 10)

General Architecture of a Dedicated-Function Data Base Machine (DF/DM)


Host Processor
Disk Files DBMS Library System Library
Host Processor
Data Base
DF/DM
OS
DBMS Interface Software
Communications Optimization
Disk Management Optimization
Data Base Files
DBMS Library

Financial soft[illegible] so advanced that [illegible] wants to keep [illegible]

Marriott [illegible]

Their software [illegible] under wraps.

So let's [illegible] fixed asset package [illegible]

[illegible]

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information [illegible]
☐ [illegible]
☐ [illegible]

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Company

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City

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McCormack & Do[illegible]

The best financial software. The best [illegible]

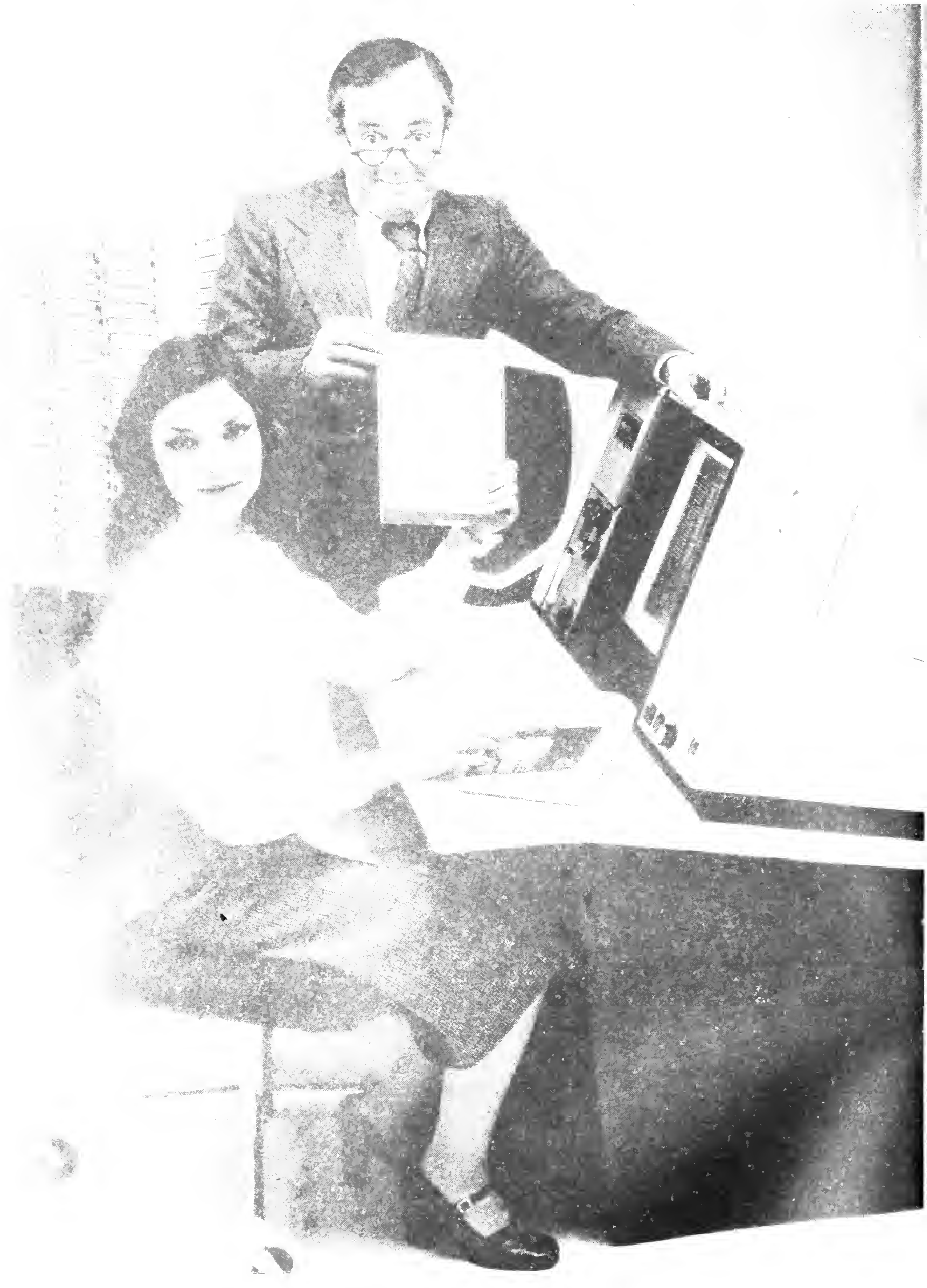
[illegible] the two examples of current [illegible] data base machines [illegible] EF DM and IDM models postulated earlier as [illegible] of data base machine architecture. But they are certainly [illegible] examples of their [illegible] nor are they necessarily [illegible] only possible architectures [illegible] base machines. They are [illegible] approximately the mid-range [illegible] users and thus do not [illegible] the problems of users at [illegible] processing spectrum.

[illegible] certain constants appear to [illegible] large segment of the processing domain to warrant some generalizations on the criteria of the ideal data base machine. These criteria will be discussed in the following and will then be compared with the Adabas and IDM models to assess the actual fit of each model to the theoretical ideal.

Relationship to Host Operating System: DBMS programs, even the smaller ones, are inevitably in regular conflict with the host operating system, usually to the detriment of the optimum execution of the DBMS. Two obvious illustrations are the running DBMS/OS battles over virtual storage space and the physical placement of data on disk storage.

The conflicts result from the goal of an OS to share system resources among as many users as possible vs. the goal of a DBMS to linearize system data into modules that can be conveniently accessed by programs known to the data base.

The resulting tug of war is between the forces of generalization and specialization, which is the underlying motivation behind the entire idea of data base machines. The ideal condition is to disentangle the DBMS as completely as possible from the host



OS and, further [illegible] dent of any specific [illegible] system [illegible]

Language Interface. [illegible] DBMS cannot be comp[illegible] Architecture and [illegible] from its host OS [illegible] connections to the host [illegible] most entirely on the nature [illegible] command/response [illegible] the DBMS and the [illegible]

The ideal interface [illegible] procedural language [illegible] operating system [illegible] tion conduit to the [illegible] compilation facilities [illegible]

Similarly, the [illegible] DBMS should be as [illegible]

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[illegible] own built-in [illegible] documents [illegible] of lading [illegible]

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In seconds [illegible] ment centered and [illegible] focused [illegible] Touch a button and it [illegible] print in just a few seconds.

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DEPT DP0516, ROCHESTER, NY 14650

[illegible]

NAME [illegible]

COMPANY

ADDRESS

STATE [illegible]

[illegible] could [illegible] persistent [illegible] from short [illegible] IBM devices.

OEM Service

[illegible] The IDM 500 is sold as an OEM de[illegible] [illegible] is beautifully indepen[illegible] [illegible] also make it impossible [illegible] from any given oper[illegible] [illegible] Someone must tailor a [illegible] software interface to [illegible] This is an unfortunate [illegible] represents an interest [illegible] software

[illegible] data base is probably the [illegible] perhaps the only choice for a [illegible] IDM [illegible] relational file [illegible] an work. [illegible] process is an ardu[illegible] [illegible] that [illegible] Very [illegible] avail[illegible]

[illegible] Model 204 [illegible] DBMS ac[illegible] [illegible] files that [illegible] hours [illegible] little [illegible]

The trade-off [illegible] relational [illegible] personally easy to maintain [illegible] circum[illegible] stances [illegible] required considerable manpower [illegible] normalize. An inverted [illegible] file has can become [illegible] par[illegible] ticularly in a large [illegible] environ[illegible] ment [illegible] it was [illegible] ex[illegible] tremely easy to load initially.

The normalization or file conversion problem will probably also effectively lock out DF DM systems from exist[illegible] ing data base users particularly if To[illegible] tal IDMS and the other established DBMS are offered in EF DM form in the manner of Adabas. Very few users will be willing to tamper with working files simply to gain a place in tomorrow's sun.

More likely they will opt for an EF - DM version of their existing DBMS and we fully anticipate that the es[illegible] tablished vendors will offer liberal software-to hardware trade-ins to dis[illegible] courage experimentation among their users.

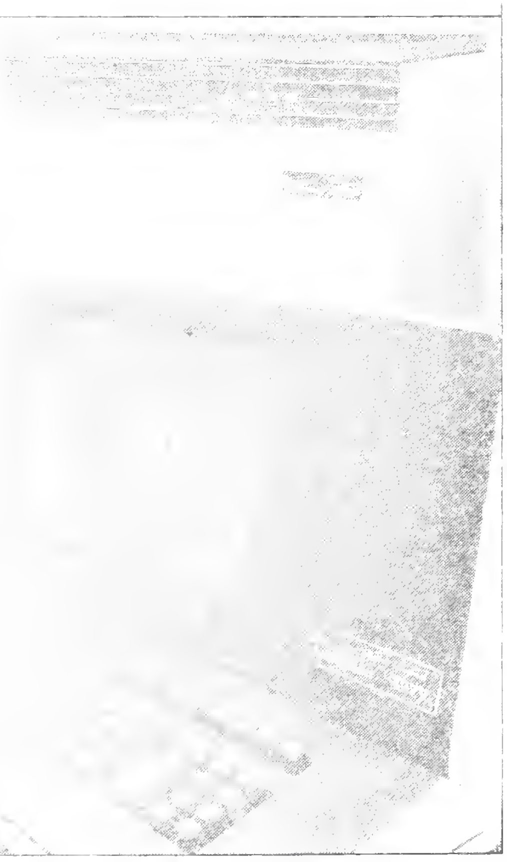
The short-term future to about 1983 for true data base machines or DF - DMs as we have defined them will probably be muted for the reasons we have just discussed but established vendors will not be able to maintain their holding pattern forever. They will have to compete very hard with the upcoming DF DM vendors for each new data base installation.

The big gainers will be the users who will be moved that much closer to the ultimate simplicity of a plug-in data base utility.

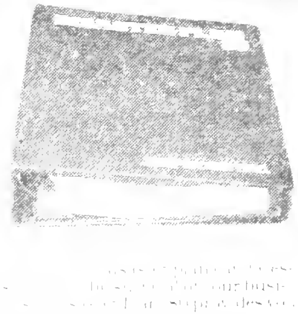
[illegible] FORMATION 4000.
[illegible] minicomputer that
[illegible] it's an IBM 370.

[illegible] system elements to be duplicated. Each com[illegible] ponent is fully functional and adds to the capa[illegible] bility of the system under normal conditions [illegible] as backup equipment when needed. [illegible] No need to worry about hardware. [illegible] installs and supports the total system [illegible] market software customized [illegible] systems or data processing services. [illegible] use Formation 4000 to expand your customer base and keep costs down. To find [illegible] write Formation, 823 East Gate [illegible] Mt. Laurel, New Jersey 08054. Or call [illegible] 609-234-5020.

formation



PLAN FOR DISASTER



[illegible] your busi[illegible] [illegible] model [illegible] to follow in [illegible] maintain [illegible] disaster recovery [illegible] plan for your company. Call or write today for details.

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RELATIONAL DATA BASE SYSTEMS: FACT AND FICTION

"Relational [illegible] system (DBMS) [illegible] methodology [illegible] tivity" and [illegible] this year at the [illegible] systems [illegible] you can [illegible] lational [illegible] But what is [illegible] lational DBM[illegible] and what [illegible] the near [illegible]

First, it migh[illegible] is meant by [illegible] case with DP [illegible] more easily [illegible] plished. A [illegible] heard of the [illegible] product [illegible] tems, Inc. [illegible] [for a [illegible]

When in [illegible] go to a [illegible] Martin [illegible]

He defined [illegible] ... a two [illegible] ements [illegible] By [illegible] base is [illegible] data [illegible] would be [illegible] recombine[illegible] data base [illegible] required [illegible]

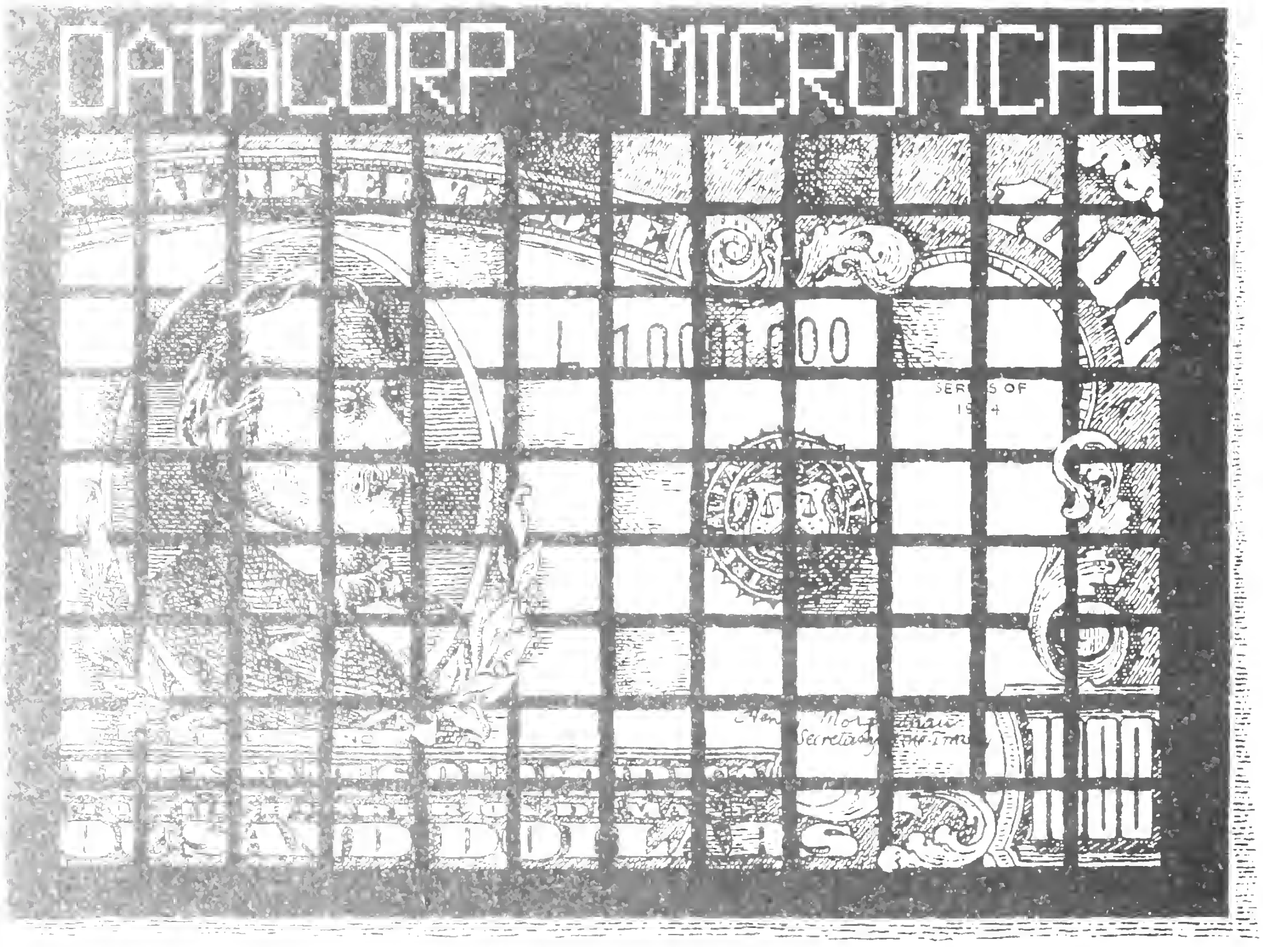
Expressed [illegible] expression [illegible]

black-box [illegible] the perhaps [illegible] requires [illegible] erations [illegible]

In order [illegible] the DBMS [illegible] through some [illegible] language [illegible] vice-president of R[illegible] ogy, Inc. (RTI). This [illegible] to utilize the data [illegible]

Shoor is senior editor, software at [illegible]

PROFIT PICTURES



Datacorp's total COM service saves you paper money

[illegible] you're spending for paper printout [illegible] cut your profit margins and [illegible] today's business climate, you [illegible] at the lowest possible cost. [illegible] Computer Output Microfilm, [illegible] the nation's leading COM service [illegible] producing 12 billion pages of [illegible] microfilm in 41 service centers [illegible] 000 customers depend on [illegible] service, fast turnaround

[illegible] Datacorp is a major [illegible] We offer complete [illegible] installation [illegible]

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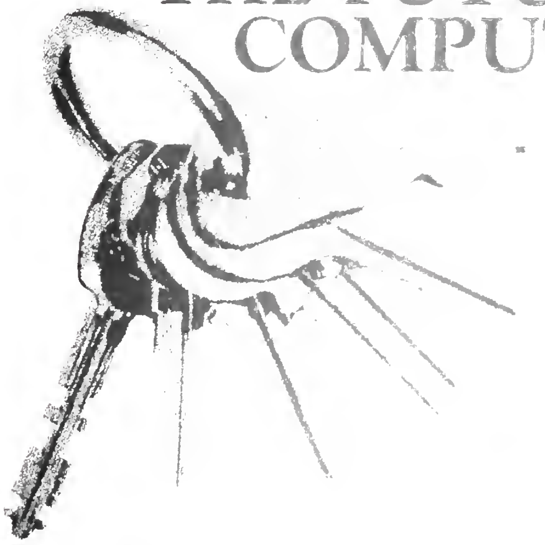
SIX TECHNOLOGIES HOL[illegible] THE FUTURE OF COMPUTING



Suppose [illegible] the managem[illegible] housed in a b[illegible] the most mod[illegible] iences would b[illegible] get would be [illegible] staff of experien[illegible] one small thin[illegible] however [illegible] that are 20 to 2[illegible] course pick th[illegible] is your prefer[illegible] haps? An IBM [illegible]

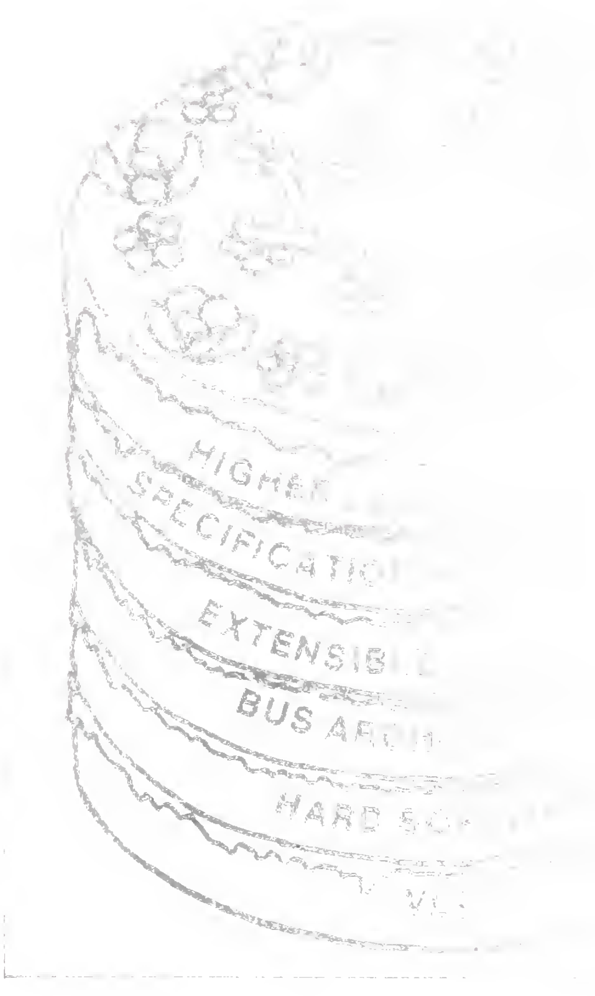
Absurd? Of [illegible] mental hardw[illegible] tectures in plac[illegible] installation tod[illegible] vintage! True th[illegible] plementations [illegible] deal over the pa[illegible] the architectur[illegible] mented in th[illegible] ware have not [illegible]

Cobol and Fort[illegible] gether account [illegible] all programmin[illegible] puter installatio[illegible] 1959 and the [illegible] published in 195[illegible] The basic Von Neumann machine architecture [illegible] been with us even longer and the specific architecture which accounts for more than 70% of all commercial use today (the IBM 360/370 architecture and instruction set and OS operating system) was developed in the early 1960s and introduced in 1964.

When you look at the way technological change occurs, you find it has some very interesting properties. Although it may appear superficially that technological innovation moves along gradual curvilinear paths, the underlying pattern is somewhat different. Technological innovation, at its core, has properties very similar to those found in the quantum states of [illegible]

[illegible] 4300 [illegible] Architecture [illegible] even [illegible] announced IBM 3081 [illegible] software no more than [illegible] set of [illegible] instruction set on the first IBM [illegible] shipped over 15 years ago. We have come to take these fundamental hardware and software architectures so much for granted that we begin to operate on the hidden assumption that they are somehow fundamental to the use of computer technology. In fact, they are not.

While the last major change in computer and software architecture is now



Zachmann is research director for the Information Systems Planning Service at International Data Corp. in Waltham, Mass.

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[illegible] [illegible] mechanical [illegible] motors to drive [illegible] machines [illegible] single [illegible] This led to [illegible] which we now all [illegible] saws, electric drills [illegible] saws. In addition [illegible] possible applica- [illegible] factory belt drives [illegible] have provided electric [illegible] appliances from the dish- w[illegible] the Cuisinart, toys and elec- [illegible]

VLSI does for computing power very much the same thing which the fractional horsepower motor did for mechanical power: it makes it available in a cost-effective way in a variety of devices which can provide computing power when and where it is needed. Already seen is the application of VLSI in automobiles, home appliances and games, as well as in the development of distributed resources computing systems. VLSI is having a broad range of impacts from business to home entertainment. Yet thus far, we are only scratching the surface.

Just as the early motor cars were called "horseless carriages" and were built as if they were that, so the early use of VLSI tends to apply it according to older models of use. We are beginning, however, to see VLSI being applied in newer, more innovative ways. This will be a rapidly accelerating trend.

Functionality Issue

Increases in speed and circuit density and decreases in cost will, of course, continue. The real issue, however, increasingly becomes one of functionality: of what we wish to do with the technology. More and more we begin to see the problems of VLSI design as programming and applications problems. Rapid growth in the use of gate array chips highlights this. The gate array chip is essentially a "programmable" chip which allows the designer to "wire" the last layer or layers on a generalized gate array very much like we wired plug boards on IBM 401 accounting machines and EAM equipment 20 years ago.

Bus architectures, the second area of technology, refers to the growing implementation of system architectures in which hardware modules in a computer communications system are linked together via standard interfaces on a common communications bus. Systems built in this way can be thought of as hardware counterparts of modularized structured software systems. Initially achieving widespread acceptance in the development of the internal architecture of minicomputer and microprocessor-based systems, bus architectures are now being increasingly used in the development of large-scale computer systems.

The most exciting area of application, however, is in the development within the last decade of effective bus architectures for local area networks. Time division multiplexing (TDM) using carrier sense multiple access (CSMA) protocols on a local network bus can be expected to be a major growth area in the next few years. While much of this activity may be in the form of baseband systems such as Xerox Corp.'s Ethernet, we feel the most significant action will come in the use of broadband radio frequency (RF) modulated systems using community antenna television (CATV) coaxial bus architectures such as that developed by Mitre Corp. and those recently made available by vendors such as Amdax, Network Resources Corp. and Digital Communications Corp.

Ultimately these bus-based local area network systems will result in major changes in the way we design and develop operating systems as well as application systems. They will result in truly distributed systems in which there is no real hierarchy in the system (i.e., no single central computer or computer complex). This will also lead to much simpler communications implementations and less complex standards requirements than those implicit in protocols like X.25 or Systems Network Architecture (SNA).

Availability of VLSI components provides a key element in the implementation of bus architectures. Bus architectures in turn will require assistance from the third of our six key technologies: new system specification methodologies.

Strict Separation

We have been seeing a great deal of activity recently in attempts to develop methodologies for specifying large or complex systems. What is required here is a rigorous (possibly axiomatically based) system which permits a strict separation between the specification and the implementation of a system, is machine independent and allows the specification to be independent of hardware/software interface boundaries. Such a system would provide automatic static validation and verification of the specified system and ultimately will lead to automated implementation.

The typical system design cycle as traditionally followed (feasibility study, general design, functional design, detail design, code and test, install, maintain) does not sharply separate design from implementation. This is true even in the most advanced installations. It is still common for the individual who must finally sit down to write code for a module to find that he must resolve remaining design questions. Attempts to organize MIS divisions with separate groups for programming and for analysis regularly come to grief because of this problem.

Recent developments in this area, such as the Higher Order Software (HOS) methodology developed by Margaret Hamilton and Saydean Zeldin, are beginning to show real promise in solving some of these prob-

COMPUTERWORLD

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lems. Along [illegible] such as Srem, PSL/PSA and SADT [illegible] methodologies such as HOS [illegible] expected to become [illegible] forms over the next [illegible]

Alternative Languages

Closely related to these [illegible] gies is renewed interest [illegible] to Cobol and Fortran [illegible] languages. We [illegible] lowing the growing [illegible] and Ada in recent [illegible] newly developed [illegible] Department of Defense [illegible] "top down" movement [illegible] new standard language [illegible] plications. On the other [illegible] can be said to represent [illegible] movement where [illegible] of students and [illegible] are learning to use [illegible] Both Pascal and Ada [illegible] language family de[illegible] inal Algol syntax [illegible] advantages for structured programming and are held [illegible] enced programmers [illegible] rior to Fortran and Cobol.

These are only [illegible] Much current interest [illegible] languages such as [illegible] next few years will [illegible] discussion and [illegible] of various languages. [illegible] nificant growth in the [illegible] languages at the expense of [illegible] Fortran.

It seems quite likely that [illegible] languages will be developed [illegible] they will go beyond the language [illegible] tures already available. In particular, we expect that truly extensible languages which are [illegible] posable and functional [illegible] will eventually prevail [illegible] mercial and scientific applications.

This means that [illegible] will be maintained by the language facility itself rather [illegible] external libraries and implies [illegible] different interfaces to operating systems than those common in the IBM OS/VS world today. We [illegible] look to systems like UCSD Pascal and the [illegible] operating system to get an idea of what the newer operating systems will look like.

The newer extensible languages will also require very large address spaces in the hardware supporting them and will be capable of employing radically different I/O interfaces. More and more noticeable will be ways in which data which would have been handled by I/O to random access disk storage will begin to look like it is within the internal address space of the program or be accessed with high-level DBMS-like syntax. We will also see data flow computational model features allowing for multiple concurrent asynchronous processes and event driven processes within the language syntax.

While new specifications methodologies and extensible languages will increasingly become part of the domain of the computer specialist, the fifth of our six key technologies, higher level software, will play a very important role in providing end users with powerful facilities for [illegible] manipulat-

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WASHINGTON, [illegible] question facing the [illegible] munications policym[illegible] will be how to stru[illegible] tem so as to maint[illegible] present services wh[illegible] nological innovation [illegible] It is not exactly a new [illegible] of the underlying [illegible] the 1950s. Despite [illegible] years, neither Congress [illegible] Communications Comm[illegible] nor the courts have [illegible] ture acceptable to [illegible] and its adversaries [illegible]

It is likely, though [illegible] mise of sorts will [illegible] during the coming [illegible]

According to one [illegible] Reagan Administration [illegible] Justice Department [illegible] tlement of its pend[illegible] against AT&T. The [illegible] have sprung from Reagan [illegible] opposing divestiture [illegible] violations of the Sherman [illegible] though he was referring [illegible] Federal Trade Commi[illegible] against the nation's [illegible] makers, Reagan's [illegible] interpreted to mean [illegible] Justice Department [illegible] member AT&T.

Even if such a settlement is nego[illegible]tiated in the coming year, AT&T's opponents almost certainly will appeal it to the U.S. Supreme Court — a move that probably would delay a final decision until 1982 or later.

Behind this negotiated settlement rumor is an unstated assumption [illegible] new administration, because it is allegedly more partial to business interests than the Carter team was, will favor [illegible]

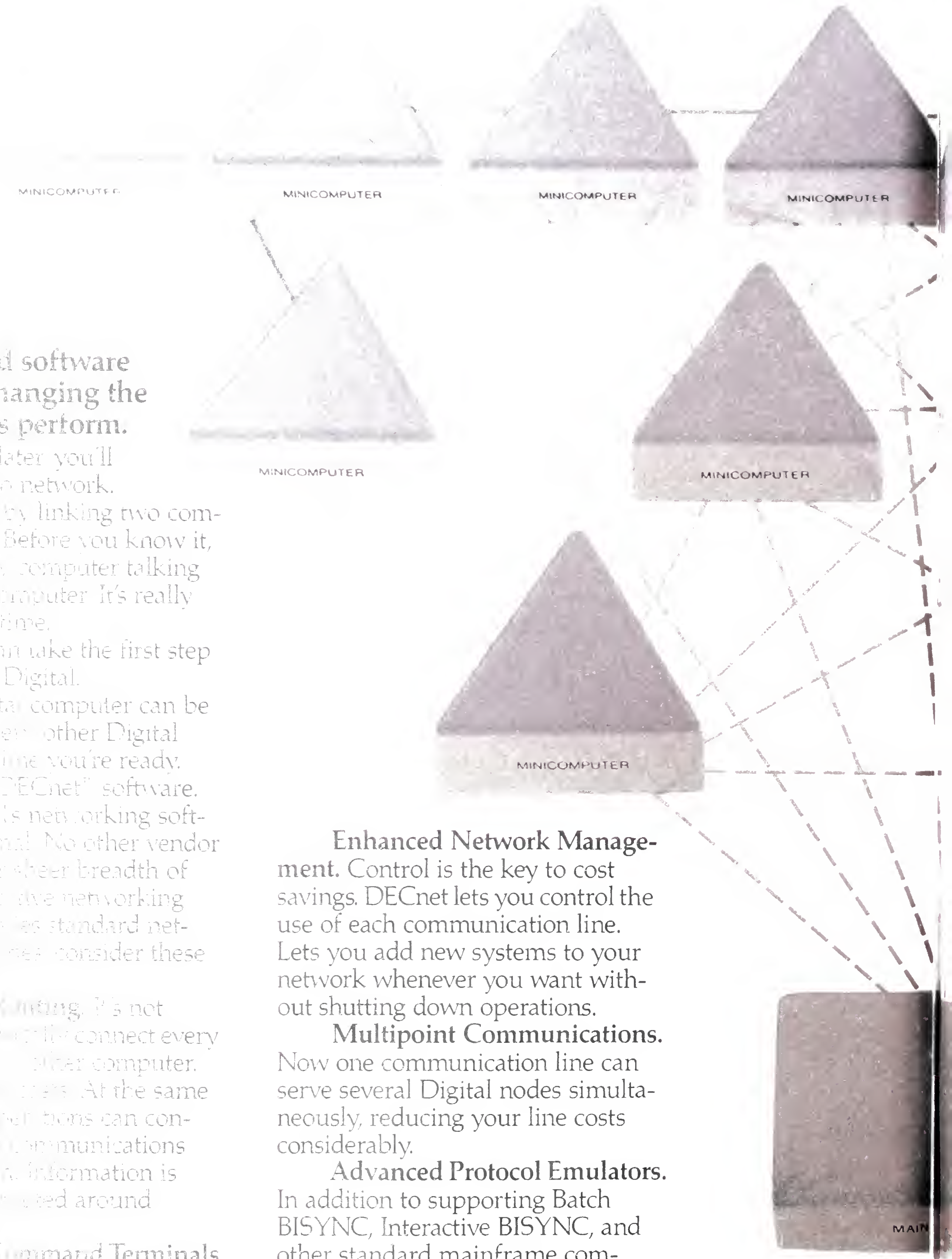
Hirsch is senior writer, communications, at CW.

AT&T [illegible]

[illegible]

Last [illegible] rewrite (S. 2[illegible] cause [illegible] tion 203(b) [illegible] structure AT&T [illegible] such [illegible] [illegible] ings [illegible] tion (D [illegible] markup [illegible]

Nobody networks



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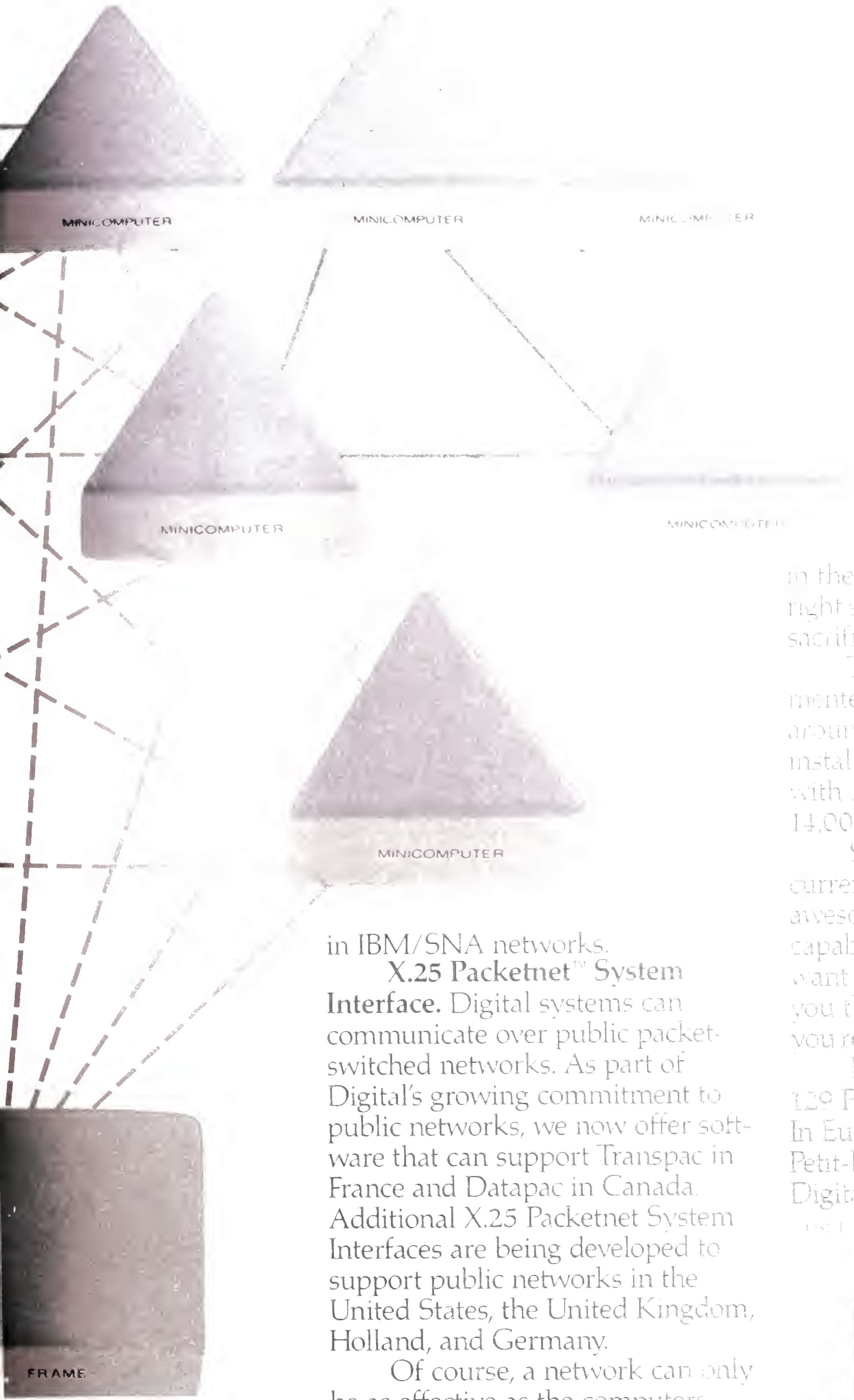

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the world think[illegible]

(Continued from Page 19)

the commission.

The Justice Department statement clearly reflects the rationale that AT&T was permitted to retain its vertically integrated structure on the basis of such a structure; conversely, participation outside of its traditional arena could be appropriate only if predicated on structural change ... in the Bell System ... re-establishment of Western Electric and Bell Labs as independent companies.

To suggest that the decree allows AT&T ... especially structured to enter an adjacent unregulated market such as data processing ... CCIA added, is contrary to the meaning of the decree as defined by AT&T and the Justice Department in the cited statements.

There is nothing particularly new about these objections. The pieces were taken from a statement CCIA submitted to the FCC last June, and even earlier expressions of the same basic idea are available. What makes the whole consent decree argument relevant for 1981 is the political change that has occurred in Congress, together with AT&T's decision to seek the New Jersey federal district court's approval of the computer inquiry decision.

Major Obstacle

Now that Packwood is the new chairman of the Senate Commerce Committee, the only major obstacle preventing enactment of a communications act acceptable to AT&T is the House. More precisely, it is the House Judiciary Committee, since the House Commerce Committee, as indicated by the bill it passed in the last Congress (H.R. 6121), has already accepted the idea that separation rather than divestiture can adequately protect the phone company's competitors.

Reportedly, Rep. Tim Wirth (D-Colo.), the likely successor to Lionel Van Deerlin (D-Calif.) as chairman of the Commerce Committee's Communications Subcommittee, wants a "stronger" bill than last year's version. But among Wirth's constituents are several thousand members of the Communication Workers of America, which shares Bell's legislative views.

The judiciary committee is another matter. In the report it published shortly after blocking a final House vote on H.R. 6121 in the last session, the committee developed several paragraphs to a discussion of the consent decree.

Antitrust settlements or agreements involving AT&T have been major watersheds in the company's history," said the committee. "The 1956 consent decree ... [has] taken on even more significance because of the Bell System's decision to enter the data processing field."

There was little disagreement among the witnesses who appeared before the committee during its deliberations on H.R. 6121 concerning the impact of Section 218, the provision allowing AT&T to offer enhanced services and terminals on a deregulated basis through one or more separate subsidiaries. "Except for the testimony of the AT&T representative and the Assistant Secretary of Commerce [Henry Geller], the witnesses ... expressed strong misgivings about ... lifting ... the decree ... Assistant Attorney General [Sanford] Litvack ... was convinced ... nothing had changed since 1956 to eliminate the anticompetitive incentives that underlay the decree. Since the decree was entered by a court, he preferred to see the court deal with [it]."

This last statement suggests why AT&T has decided to ask the New Jersey federal district court to declare that the computer inquiry decision does not violate the consent decree. As a judiciary committee spokesman pointed out, if the court accepts the phone company's argument it would carry a "great deal of weight" with the committee. The implication is that a majority of the members would then agree that Bell can offer enhanced services on a deregulated basis through one or more separate subsidiaries, thus clearing the way for passage of a new communications act acceptable to the phone company.

It is far from certain, of course, that the New Jersey court will agree with AT&T. Even if it does, CCIA and other opponents of the FCC/AT&T interpretation will appeal the decision. That may help rather than hinder Bell. If a final judicial decision is delayed, Congress probably will enact a new communications act before the verdict is in.

Packwood, as mentioned earlier, clearly wants Congress, not the courts, to resolve the structural question. At a recent press conference, after observing that he believes "a substantial portion of [the Bell System] can be split into separate subsidiaries," Packwood said he is "prepared to go ahead and introduce a bill early next year" if the Reagan Administration does not draft one of its own.

Later, an informed source said Packwood was not suggesting Congress should supersede or set aside a court decision specifying AT&T's corporate structure; rather, he wants Congress to decide the question before any court verdicts are announced.

It may be significant that news of AT&T's plan to seek judicial review of the computer inquiry decision surfaced immediately after Packwood's press conference.

All of this suggests that Bell's best strategy would be to present a convincing argument in the trial phase of the antitrust suit, scheduled to begin next month in Washington, and to ask for a hearing in New Jersey as soon as possible. If the company's lawyers are sufficiently persuasive in that forum as well, they should be able to convert at least some of the legislators who opposed last year's communications act rewrite.

AT&T Strategy

One argument Bell seems likely to make in New Jersey is that unless the consent decree is clarified, the phone company will be undertaking a substantial risk if it continues to market terminal equipment, and may decide not to do so as a result. The reason: The computer inquiry decision detariffs this equipment, and several critics, including the Justice Department, contend the consent decree prohibits Bell as well as its subsidiaries from offering terminal equipment on that basis.

The other main element of Bell's strategy is to delay final action in both court proceedings until Packwood and his associates can enact the kind of bill they seem to have in mind. If the legislation can be enacted first, it will indicate in unmistakable terms that Congress wants AT&T to offer enhanced services and terminal equipment on a deregulated basis, regardless of what the consent decree may say, and that it also does not want the Bell System broken up despite the Justice Department's contrary views.

Since Congress has been arguing about telecommunications policy for at least five years without accomplishing very much in terms of legislation, there is certainly a possibility it will not enact a bill soon enough to influence the court proceedings. But this may not be necessary. If the legislation gets through one chamber by this time next year, such as the Senate, Bell will probably gain valuable leverage. As a result, one of the key battles in the coming Congress is likely to be procedural. The phone company's opponents almost certainly will do whatever they can to prolong the committee debate.

While no one can predict at the moment whether the phone company's strategy will succeed, it appears that AT&T, because of what happened last November, is in a far better position than a year ago. It is also probable that AT&T has only a limited amount of time. There will be another election in 1982. Before then, though, the legality of the computer inquiry decision and the Justice Department's antitrust charges probably will be established. Any one of these developments could destroy the phone company's present advantage.

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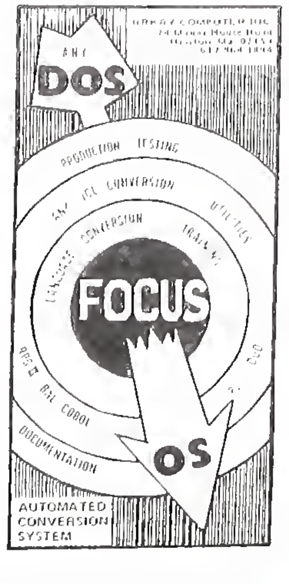

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[illegible] IBM [illegible] it would [illegible] plex.

White said [illegible] plans to delve more [illegible] into the software [illegible] in hopes of cashing in on some areas where IBM is lacking.

Software expertise offers the opportunity for both an offensive as well as defensive strategy to deal with the vagaries of the dominant supplier in the software area. "As the dominant supplier looks increasingly to software as an additional revenue source so must the PCMers," White said.

Well said he may be right

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[illegible] LUNCHEON SPEAKER

Wednesday, January 14, 1981

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experts [illegible]

Conference Progr[illegible]

8:00 S-6 Frank K. Griesinger
9:00 E-1 Dr. Howard Frank
E-4 Dr. Leonard Kleinrock
LUNCH
S-8 James [illegible]
G-1 Ken Thurber
G-2
F-5 William Warner
Roy Bening

SPECIAL PRECONF[illegible]

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[illegible]TER GRAPHICS [illegible] OF AGE

Computer graphics is [illegible] business [illegible] During the '70s [illegible] generally [illegible] systems [illegible] '80s will produce a [illegible] computer graphics [illegible]

[illegible] graphics will be widely available [illegible] personal desktop [illegible] computers [illegible] either [illegible] will be available at a [illegible] commen- [illegible] computers for [illegible] $1,000 [illegible] small plotters [illegible] and [illegible] com- [illegible] $20,000 for large drafting- [illegible] computers.

[illegible] understand the impact [illegible] on the [illegible] important to [illegible] broad application areas [illegible] data display [illegible] display graphics [illegible]

• **Data display graphics** is character- [illegible] graphics [illegible] business and [illegible] a graph to [illegible] and analyses [illegible] provides an excel- [illegible] numerical in- [illegible] allow [illegible] may be [illegible] CRT or [illegible] such [illegible] and line [illegible] graphic [illegible]

• **Real-time display graphics** is [illegible] and is fre- [illegible] modeling and [illegible] simulation. It can be useful [illegible] business and technical applications although more examples of technical applications can be found. Although it is sometimes similar to data display graphics it is dynamic and produces a new graphics presentation as conditions change or new data is received. Examples include process monitoring flight simulation and radar sonar tracking.

• **Design graphics** can best be described as the conceptualization design and dimensioning of objects. It frequently involves computer-aided design computer-aided manufacture (CAD CAM) applications and is generally found in large manufacturing companies. The large concentrations of design graphics applications are in the areas of electrical design mechanical design and architectural design.

While the application areas in each of these graphics market segments are quite different they have one common attribute the beneficial effects of graphics on both business and technical productivity. The strong interdependence of graphics and productivity improvement will be a central focus throughout the early '80s fueling the development of the automated office and automated factory.

The power of graphics to improve the human computer interface has led to a great deal of interest throughout the computer industry. According to several industry and business journals computer graphics is one of the fastest growing markets in the industry. The sale of all graphics peripherals, software and systems is estimated to exceed $1.5 billion in 1980. The market itself is growing at a rate of more than 25% per year.

The power of visual information has been recognized since cavemen began drawing pictures on cave walls. Confucius' famous statement about a picture being worth a thousand words is taking on a dramatic significance today as modern research on information processing and the human brain shows that a single picture can sometimes convey more than 1,000 pages of written material.

While computers may be ideally suited for an alphanumeric interface, a study of neuropsychology by Marvin Patterson engineering manager at Hewlett-Packard Co. indicated that the human brain may more effectively utilize a graphical format. The two distinctive cognitive modes of the brain — symbolic sequential mode and graphical parallel mode — process information differently and make widely varying uses of the visual channel capacity. The symbolic mode — verbal and written language functions mathematical skills and other operations that involve logical manipulations and interpretation of symbols — makes minimal use of the visual channel capacity. The graphics mode — the ability to recognize scenes visualize special information and recognize patterns or interre-

---

Hamilton is marketing manager, Desktop Computer Division, and chairman of the Graphics Task Force at Hewlett-Packard Co.

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and analyze [illegible]

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The [illegible]

- Decision support [illegible]
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[illegible] CAD/CAM [illegible] performing design [illegible] providing machine [illegible] suitable for manufac- [illegible] finished PC board. This [illegible] is then utilized as input to the [illegible] equipment to manufacture PC [illegible] drilling boards, per- [illegible] the photolithography and even automating the loading of the components on the PC board.

Technical applications tend to de- [illegible] more sophisticated and more ex- pensive [illegible] graphics capabilities [illegible] business applications. Dedicated CAD/CAM systems frequently cost $150,000 to $200,000. Although process monitoring systems are also frequently very expensive, the graphics display is a small part of this system cost. Process monitoring displays are available in the $2,000 to $3,000 range.

The cost of computer graphics is substantial, but without it many of the technical applications could either not be accomplished or would require highly skilled technical resources, a cost in labor that more than offsets the cost of the equipment.

State-of-the-Art Graphics

Graphics is virtually available on the entire range of computers, from personal and desktop computers to large mainframes. Graphics has perhaps had its greatest impact on the hobby computers, professional computers and desktop computers. Computers such as the Hewlett-Packard Co. HP 85, the Radio Shack TRS-80 and the Apple II, which range in price from less than $500 to $5,000, have provided computer graphics as an integral part of the system.

The user who in the past would have considered computer graphics beyond his or her budget and ability is given an opportunity to utilize graphics at a nominal incremental cost. These computers, programmed in Basic, emphasize a data display graphics capability and require minimal training to program.

Desktop computers such as the HP 9845 and the Tektronix Inc. 4050 have graphics built in. These systems, which cost from $5,000 to $25,000, provide sophisticated graphics for data display, real-time display and design. Desktop computers have displays from 12 in. to 19 in., pixel (smallest discernible picture element) resolution of 500 by 500 or 1,000 by 1,000 and are available in both monochromatic and color versions.

Graphics display speed becomes an important characteristic in these sys-

(Continued on Page 30)

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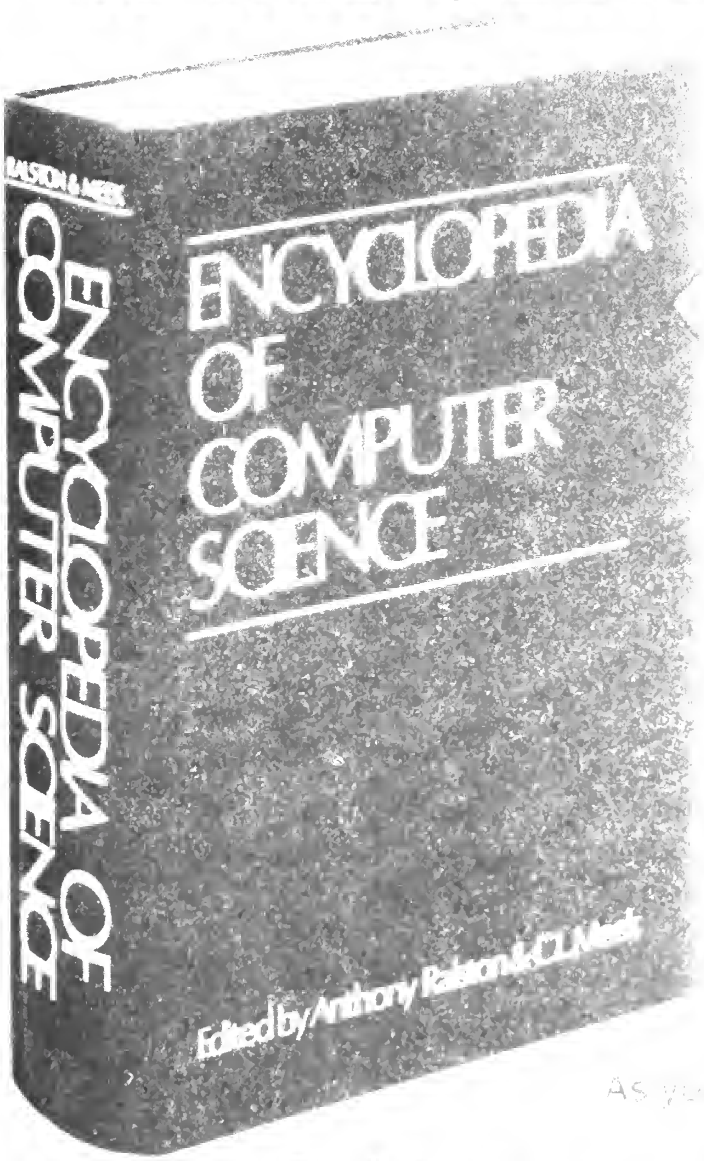
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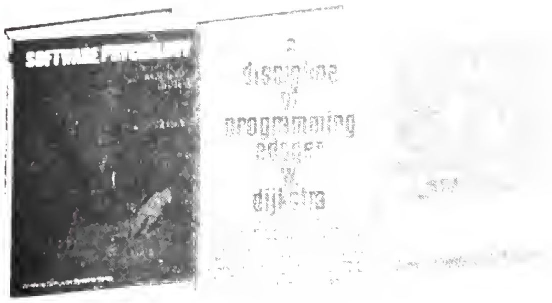
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The small computer system [illegible] and grows and grows and g[illegible]

[illegible] are the [illegible] systems [illegible] used for business applications. They're also pretty [illegible] environment. [illegible]

And [illegible] tems than [illegible] value to support [illegible] growth.

[illegible] transaction [illegible] essing [illegible] tions. We call this combination of hardware and software [illegible] ware. You'll call it the [illegible] system you've ever [illegible]

Honeywell

[illegible] near ru- [illegible] software that [illegible] thought [illegible] communication [illegible] shapes [illegible] rather than data points

O NCE UPON A TIME,

in a kingdom far away, there lived a hard-working merchant.

Usually, the merchant was the merriest [illegible], happy with his calling and ready [illegible] for everyone he met. This day, however, [illegible] in fear at the edge of the Great [illegible] Forest, his sack slung over his shoulder. You can imagine how his heart jumped when a voice behind him [illegible] "What do you have in your sack, merchant?"

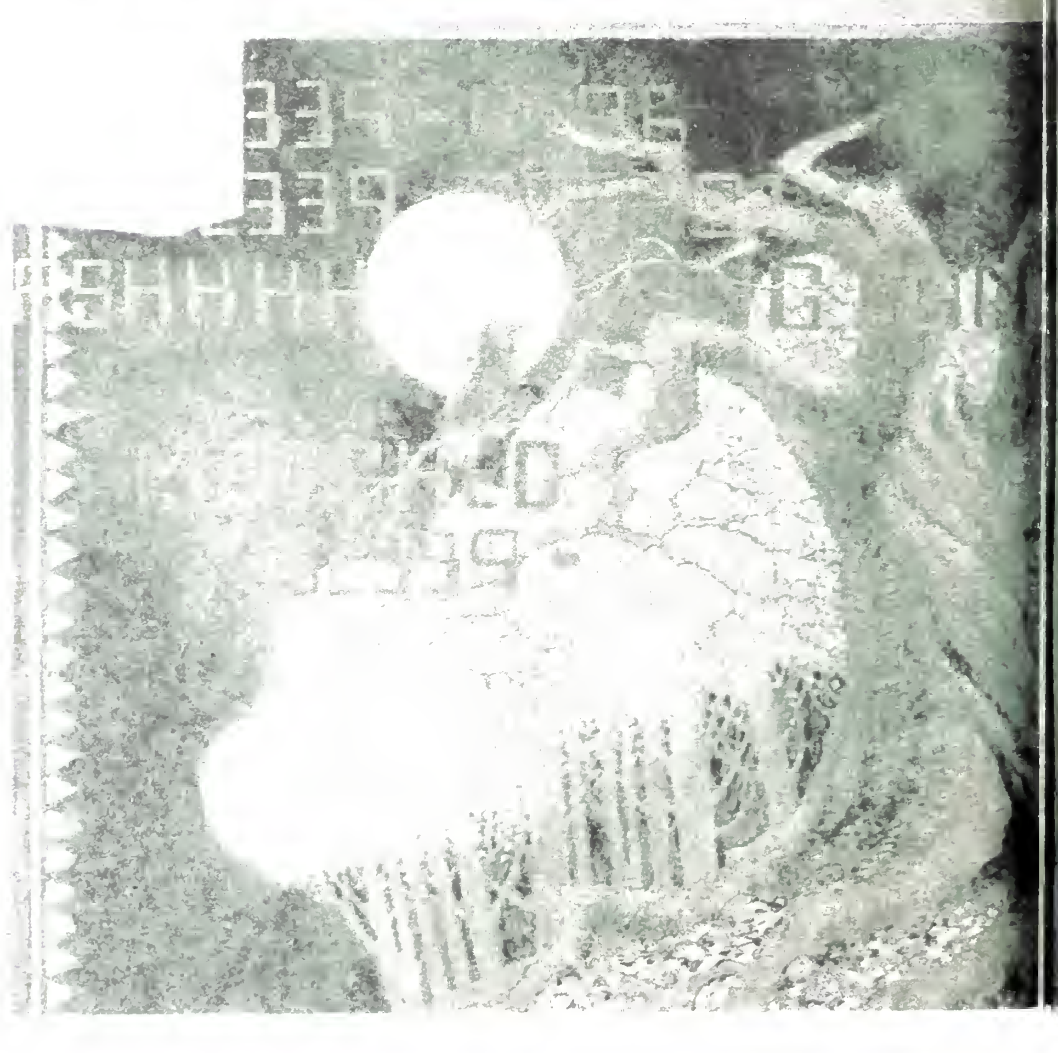
Turning around, the merchant saw a tall figure, with a [illegible] white beard and robes, and eyes that shone with [illegible] and kindness. "I have notices to the people [illegible] kingdom," blurted out the merchant, "telling of all [illegible] wagon when I come to visit [illegible]."

[illegible] taking them through the Great [illegible]?" said the tall stranger. The merchant [illegible] "The King has made a Royal Proc[illegible] from now on, all notices to the kingdom will cost less to send, and they will be delivered faster. But only if they go through the Royal Post Office on the other side of the Great Unknown Forest. That's where I'm going now, Sir. But I'm very afraid, for everyone knows there are many fearful monsters there."

"You need not be afraid," said the white-haired stranger softly. "I am a Sage, wise in the ways of the Great Unknown Forest. I know how to cross the Forest safely, and I can unlock the great riches to be found there. Come, merchant, I will guide you."

The merchant learned much that day. He learned that the Nine-Digit Zip Code Monster, while indeed quite unnerving on first acquaintance, might not be quite the horrible creature so many people said he was. He learned that the terrible Postal Carrier Root Monster wasn't going to entangle him hopelessly, as many said it would. It just wanted to get his notices to the villagers faster than ever, and for 20% fewer pennies than before. Most important, the merchant learned that whenever he faced new address-matching and geocoding problems, the Sage could show him how to turn those terrible unknowns into profit-making opportunities.

From that day forward, the merchant was happy and prosperous. He married the king's beautiful daughter (didn't I mention her?), and they lived happily for quite a while.



and vectors. [illegible]

The user interface [illegible] enhanced through [illegible] boards, as well as [illegible] put devices. Graphics [illegible] ticularly as it relates [illegible] some progress. The [illegible] ity of photographic [illegible] improved in the [illegible] laser hard-copy [illegible] and competitive [illegible]

The price/perform[illegible] systems will contin[illegible] rate better than the 2[illegible] cline in the compu[illegible] decreasing cost of [illegible]

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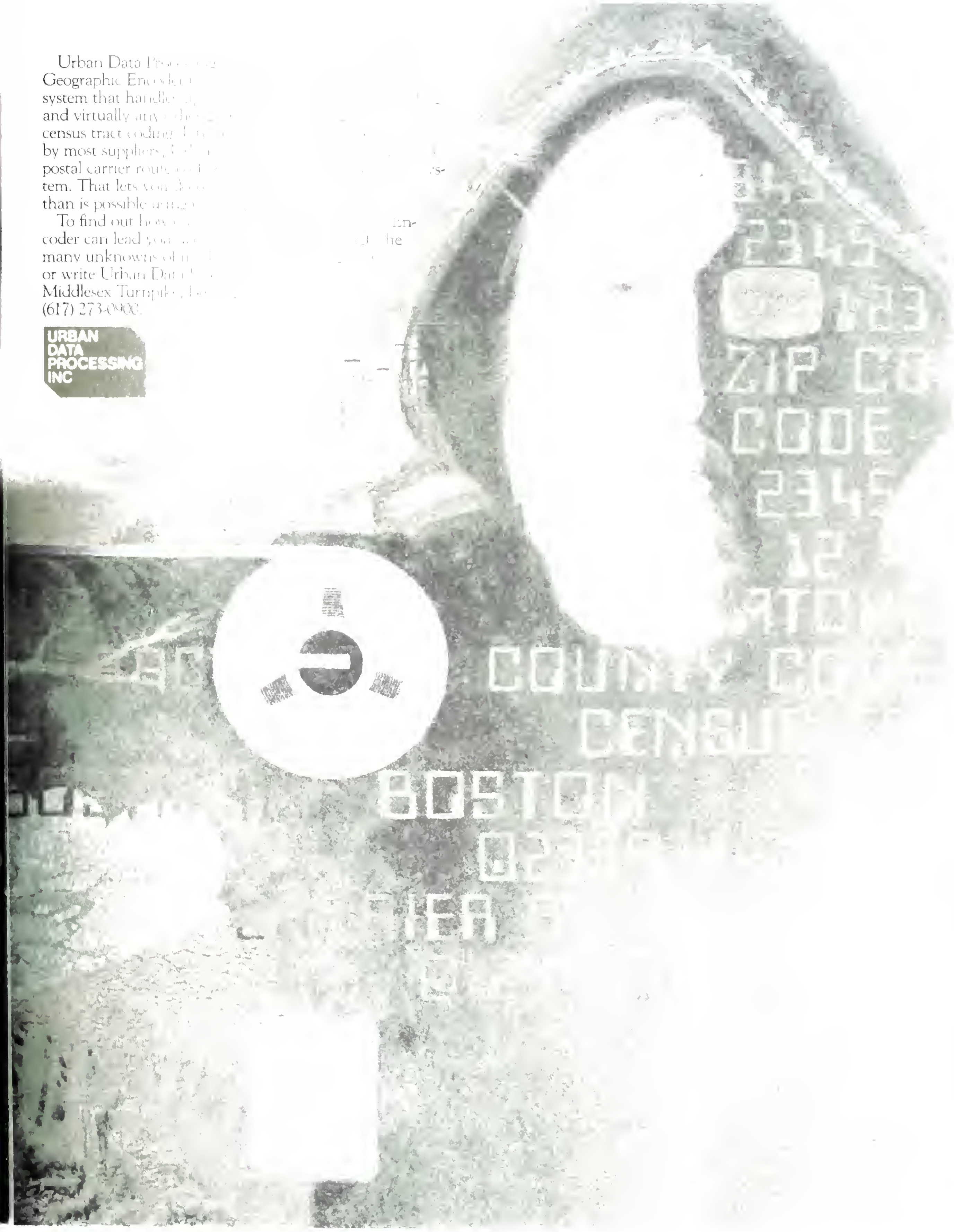

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[illegible] when [illegible] with your [illegible] auto- [illegible] system [illegible] ose [illegible] 5 [illegible] en docu- [illegible] llation; improved [illegible] a powerful data set [illegible] SD space billing; [illegible] and interfaces to other significant software packages such as TLMS, TMS, SPF, RACF and ACF2 (Access Control Facility—also marketed by The Cambridge Systems Group, natch) and ongoing enhancements we make *at no extra charge* to users, monsters are finding they no longer have uncontrolled access to data storage devices at the computer sites that have ASM2, and customers are finding out why ASM2 remains the continued leader in the field.

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USER BUDGETS: UP, UP, UP

Overall Budget	Up 12%
Salaries	Up 13.1%
Communications:	
Line Charges	Up 23.1%
Terminals	Up 37.6%
Packaged Software	
Systems and Utilities	Up 18%
Applications	[illegible]
Minicomputers	[illegible]
Mainframes	[illegible]
Peripherals	[illegible]
Maintenance	[illegible]

They're [illegible] chines, but [illegible] people

Managers [illegible] ing 45.6% [illegible] budgets is [illegible] by employ[illegible] average [illegible] rants concern[illegible] spending [illegible] another 13.[illegible]

Respondin[illegible] *world's* annua[illegible] 45 top [illegible] from aroun[illegible] ported [illegible] costs and [illegible] people [illegible] aches

Overall [illegible] pected to [illegible] in 1981 [illegible] tives told [illegible] 71.1% of the [illegible] vey are plann[illegible] their budgets [illegible] 17.8% plan to [illegible] 1980 spending [illegible] mainder were [illegible] unsure of [illegible] year's budget increase would be

But in almost all cases the department heads indicated a cost consciousness that few in DP have had to contend with until recently

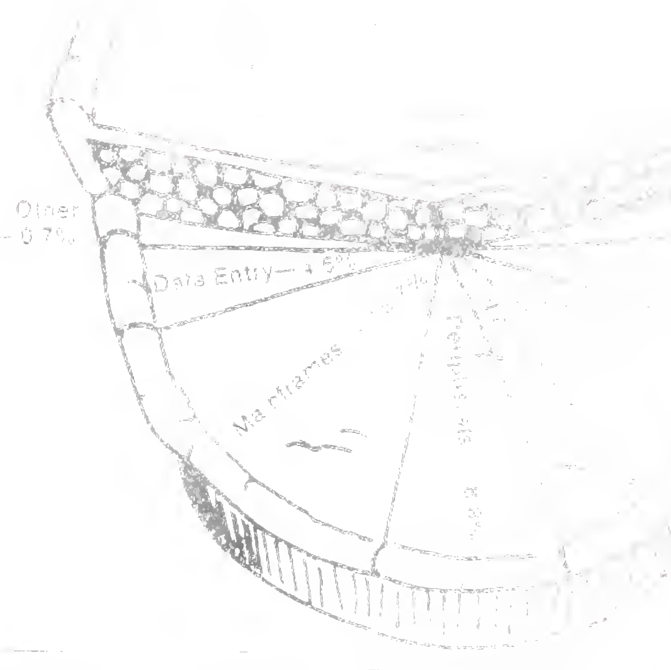
Increased productivity was uppermost in the managers' minds, no matter how large or a budget increase was anticipated. Methods to achieve this varied among the respondents — some planned to hold the line on equipment purchases or employee hiring while [illegible]

[illegible] terminals and [illegible] and switching [illegible] entry environment [illegible] sults show [illegible]

Salary costs rose steadily among all the users surveyed, unlike some equipment categories which were affected by specific purchases of high-cost items

The lowest salary apportionment was made by a Billings, Mont., DP director who allotted only 25% of his budget to salaries. At the highest point salaries totaled 70% of the computer budget for Donald Steel, director of information services at Tobin Packing Co., Albany, N.Y.

The Computerworld *annual budget survey was conducted by staff writers* [illegible] *Bruce Hoard and Marguerite Zientara*



The Budget [illegible]

[illegible] spending [illegible] packages [illegible] base management systems — which [illegible] much smaller number [illegible] responses — will increase an average of 6.2

Mini Outlays

Allotments for minicomputers will rise 25.6% in 1981 if the survey respondents utilizing minis are correct. [illegible] number of users are planning to obtain minis for [illegible] next year or will [illegible] their usage as [illegible] no significant [illegible]

[illegible] 2.45 [illegible] Burroughs Corp. [illegible] B3500 system [illegible] of peripherals [illegible] spending will increase [illegible] average 12.2% More [illegible] of the respondents [illegible] to maintain similar [illegible] habits of 1980. In [illegible] spending for peripherals [illegible] indicated by [illegible] of the users while Cecil [illegible] director of systems [illegible] DP for the Port of Seattle [illegible] he was decreasing [illegible] peripheral expenses. [illegible] is also planning to decrease spending for systems maintenance by implementing a distributed system [illegible] that will experience [illegible] increase will be [illegible] Approximately [illegible] managers will be increasing their maintenance costs, 26.9% will stay at this year's level and 11.1% are planning to decrease their maintenance costs over the 12-month period.

Supplies — traditionally an area of cost contention among users — will again be going up this time by an average of 8.4% according to the computer executives polled. Citing paper and forms as the primary contributor to inflation, 60% of the users indicated [illegible] costs would be increasing in 1981. Nearly 25% report they will remain at 1980 spending levels for their supplies and 2.2% report they will be reducing their supply costs.

Those users who reported being able to hold level or reduce costs most often attributed this achievement to getting away from paper by using more terminals and microfiche. Some plan to curtail their customized forms usage or switch to using both sides

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[illegible] From $450.00 [illegible] lease
[illegible] From $450.00 [illegible] lease

5. Integrated Applications System Structures [illegible] From $900.00 [illegible] lease

[illegible] are distributed as [illegible] load modules [illegible] Shipping & sales tax if applicable are additional

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Company
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[illegible] BANKS.

THINK UPTIME.

intertel MODEMS NETWORK CONTROL

of a form or adding to [illegible] lines-per-page ratio [illegible]

Although the managers polled did not predict salaries to be the highest rising cost in 1981, they ranked it as the most inflationary item in 1980. This may be a warning that keeping salary costs down may be an unrealistic expectation, given the anticipated rate of inflation and the need to remain competitive in the face of a high turnover rate expected throughout [illegible] year.

Departing from budget concerns, respondents mentioned some other worries for the coming year — and the number 1 problem was [illegible] personnel (see story [illegible] 45).

System development [illegible] conversion problems [illegible] ability to keep oper[illegible] ning was the second [illegible] mentioned concern [illegible] users. Long-range [illegible] for system purchases [illegible] ware applications [illegible] pany growth paths [illegible] ranked high by [illegible] executives. "We [illegible] time to plan [illegible] We're running as [illegible] can to fulfill user [illegible] need an overall [illegible] department and [illegible] pany," one San F[illegible] area manufactu[illegible] president of information services stated.

Other concerns [illegible] of users were [illegible] productivity [illegible] port, department [illegible] tion, DDP [illegible] holding down cost[illegible] and the availab[illegible] uptime.

WP Func[illegible]

The comp[illegible] ported that [illegible] word processing [illegible] tion in [illegible] spread [illegible] partments [illegible] came under [illegible] data processing [illegible] tion processing [illegible]

While 11 [illegible] nies surveyed [illegible] processing [illegible] those that [illegible] computer [illegible] their direct[illegible]

[illegible] ing WP [illegible] mental [illegible] Only 13.3 [illegible] word processing [illegible] pany played no [illegible] lection, according [illegible] vey.

In examining [illegible] department's budget [illegible] in the general [illegible]

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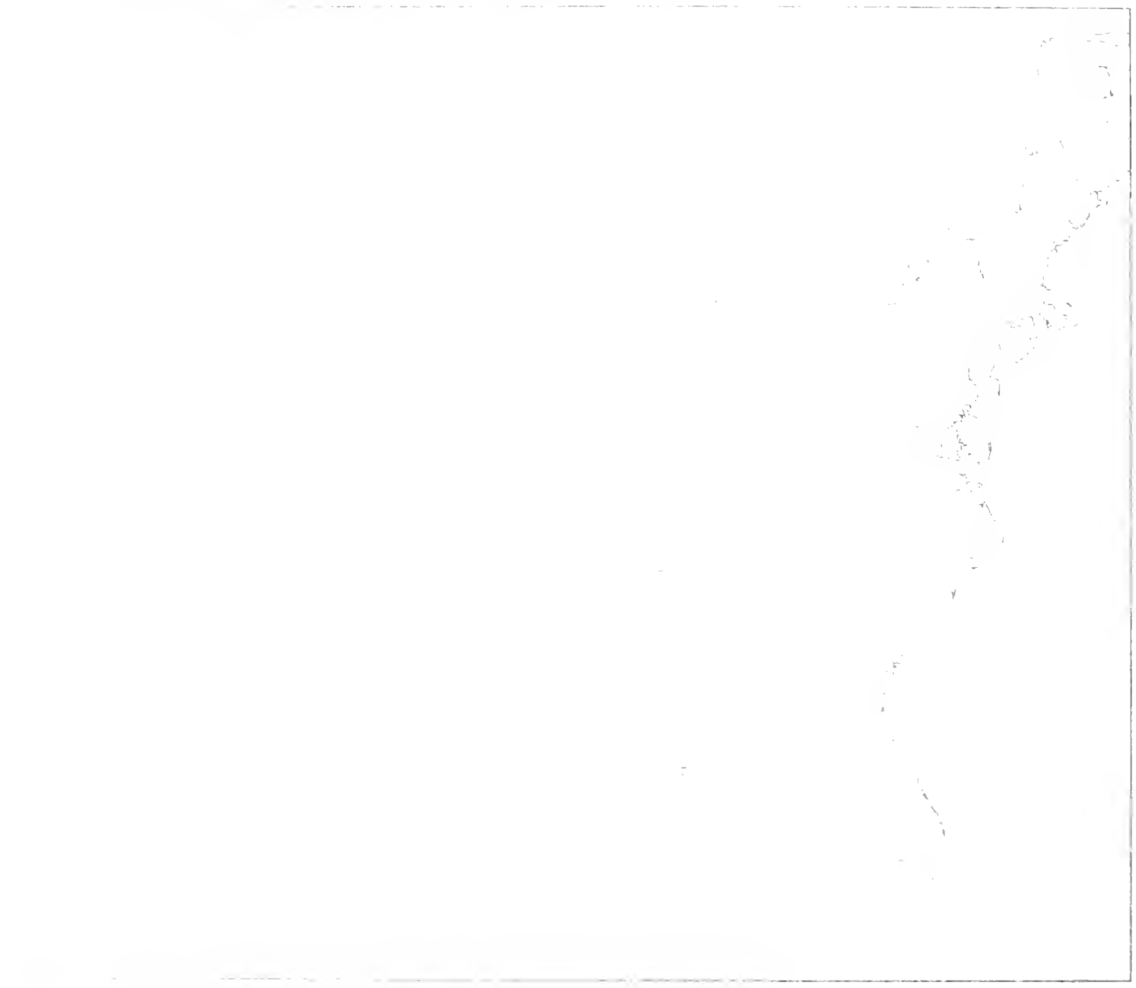
Buying Iron is the Wrong Way to Buy a Printer.

By Don DeCamp

[illegible]YMENT: THE '81 OUTLOOK

[illegible] Areas of North America



[illegible] an era of processed in-[illegible] whose ultimate course has [illegible]. Computers liter-[illegible] with almost every aspect [illegible] business and government [illegible] continuing to have a profound [illegible] as well. [illegible] scarcely unheard [illegible] become commonplace [illegible].

[illegible] Information Age was in its [illegible] 1980 the levels of [illegible] may have be-[illegible] the user de-[illegible] the revo-[illegible] the industry's re-[illegible] intensifi-[illegible] one of the key rea-[illegible] current person-[illegible] institutions such [illegible] insurance companies [illegible] been large con-[illegible] technology but [illegible] rapid increase [illegible] availability of small [illegible] future impact [illegible] on the country's [illegible] are just now [illegible].

[illegible] of prepackaged or [illegible] programs that can [illegible] to meet specific in-[illegible] creating new applica-[illegible] computer technology at an [illegible]. By 1990, automated [illegible] and offices connected by complex computer controlled telecommunications networks will be commonplace. Home computers will create another strong user demand area over the next few years.

Proliferating user demand explains why the most serious current need for DP professionals lies in the applications end of the industry. Companies across North America report that the shortages that most paralyze their ability to harness computer technology are for applications programmers, programmer analysts and systems analysts, particularly those with between three and five years of experience.

Many executives have said that they have committed time, resources and large sums of money to projects that must be brought to completion, but which are currently stymied for lack of an adequate work force. In the past, these managers would have relied on new technology to compensate for limited staff. This may not be the case in 1981, when we may see fewer major technological developments on the horizon to relieve the pressures created by personnel shortages. In most companies, seven people will be doing the work of 10.

There is an equally serious shortage of technical support people. This technical shortage has been caused in part by newly created positions, but also by the rapidly increasing number of small systems houses and software suppliers, which are attracting some of the most experienced and innovative talent in the industry. Many DP professionals said that the opportunity for personal development and for keeping knowledge at the state of the art are far greater within a small systems house than a large company. A common problem for the highly motivated DP professional who participates in the implementation of a system on the corporate level is that once the system has been established, maintenance is often routine. At this point, with so many other opportunities available, many professionals opt for a more challenging position elsewhere.

The professional shortage is compounded by several factors. Universities are not graduating enough new talent and educators are not encouraged to remain within the university environment since they can often earn more in a corporation or software house than they can as a full professor. Secondly, people are not being attracted to the profession in the numbers calculated to sustain its development, a fact that many attribute to the lack of a so-called family tradition that is characteristic of the medical and legal professions. And lastly, those who do receive some form of technical education frequently lack the business background that will enable them to effectively apply their newly acquired

(Continued on Page 40)

COPING W [illegible]

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skilled DP [illegible]
technical [illegible]

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of 45 DP [illegible]
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recruitme [illegible]
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budg [illegible]

Zu [illegible]

[illegible] can smooth [illegible] and reedu[illegible] systems [illegible] may be [illegible] necessity in [illegible] ges in the DP [illegible] companies [illegible] with [illegible] to learn [illegible] specific knowledge of language or hardware.

In addition to filling such knowledge gaps, well designed and carefully run training programs have the added benefit of keeping staff up to the state of the art. This enables employees to continually upgrade their skills and can be a morale and incentive booster for an individual to remain with the company.

The second trend is the evolution of the contract programmer, in effect a form of office temporary who works for companies on a project-by-project basis. The contract programmer will be utilized much more in 1981. With the development of more small business systems, many companies will not have the need for a full-time DP staffer, but may simply require someone to adapt a system and handle the start-up. Companies who do need full-time programmers frequently can not locate them.

As a result of both these factors, more and more programmers will begin to work on a limited contract basis, handling specific assignments for a prearranged period of time. This may be mutually advantageous to both company and programmer, who find that they can solidify their working relationships as a result of this getting-to-know-one-another period.

For programmers working on a contractual basis has the added benefit of increased mobility, allowing them to investigate a new geographic locale for several months before making the decision to relocate.

Although there is much talk in the industry about software shortages, a serious scarcity of qualified personnel is literally embracing every phase of the industry and is acute in the hardware sector as well. Demand for mainframes and minicomputers is expected to remain strong and steady, but perhaps the greatest area of potential growth in 1981 will be in microprocessors.

Microprocessors have application in just about every phase of the computer industry, but will be particularly vital to the development of small business systems, home computers and the electronic gadgets of every sort that are gaining popularity among consumers.

Personnel shortages are fairly well distributed by industry and by geographic locale.

Perhaps the greatest demand for user-oriented DP professionals in 1981 will be in the services industry. In fact, the U.S. Department of Labor predicted a 109% increase in the number of computer professionals employed in this

(Continued on Page 48)

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(Continued from Page 43)

"I'm a heck of a nice guy to work for," the DP director of an Eastern heavy equipment distributor said, echoing the sentiments of several respondents who observed that workers stayed with companies where they were treated with respect and offered liberal benefits.

The overwhelming percentage of respondents — 48.9% or 22 people — indicated their turnover rates had stayed the same in the last two years. Five of the 22 said they had no turnover in that time, although the figure may actually be higher since some interviewees may not have felt it necessary to answer beyond saying the rate was the same.

"We keep our people happy with profit-sharing, a stock purchase plan, discount vacation plan, good salaries and good fringe benefits," said Bill Sanders, vice-president of information services at Tri-State Motor Transit of Joplin, Mo., one of those with no turnover at all.

Another shop, with [illegible] workers, has had no turnover in four years. "I like to think it's a good shop," remarked David Henry of W.B. Reily & Co. in New Orleans. Furthermore, when Henry needs new personnel, he relies on "word of mouth — that's usually all it takes."

One shop that has had no turnover other than data preparation in the last two years finds a problem in its "Brand X" equipment — NCR Corp. or Burroughs Corp. — as opposed to IBM, according to Robert Chouinard, DP Director at Ryans Inc., a wholesale grocery distributor in Billings, Mont.

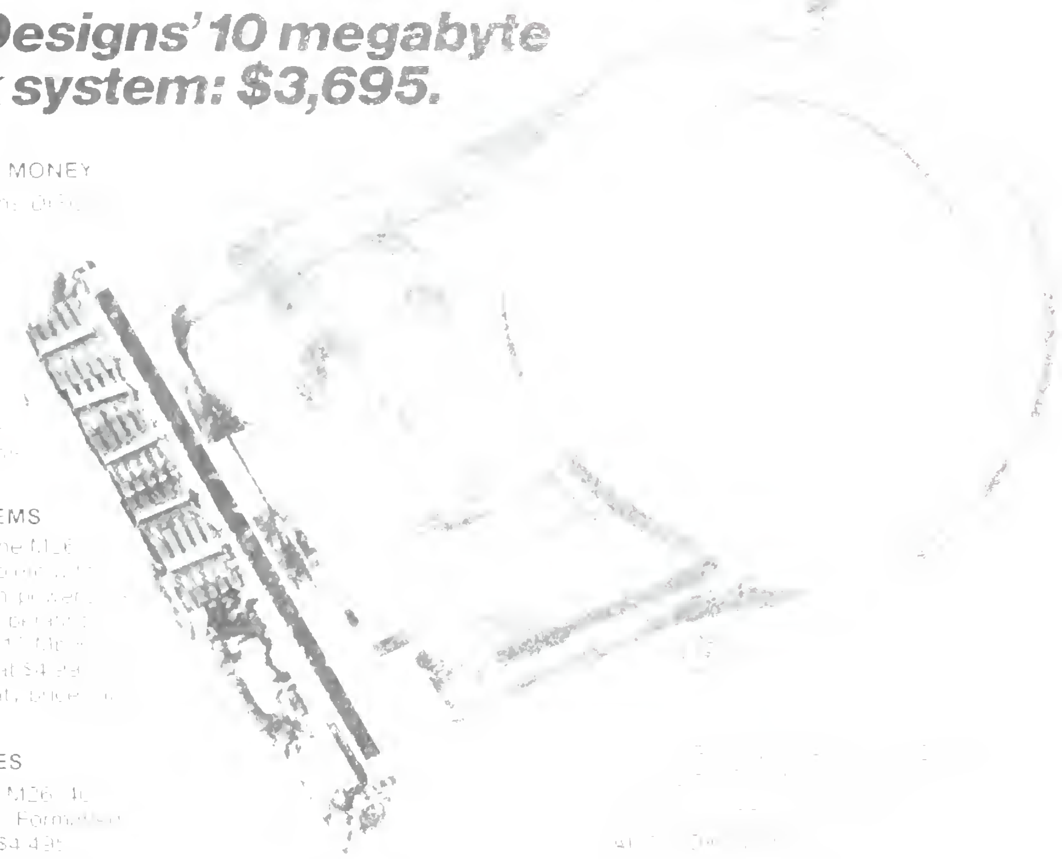
The firm, whose newly acquired parent company is effecting a switch from NCR to Burroughs equipment, "can't find people skilled in our equipment," Chouinard complained.

New Hires

The stated difficulty in finding skilled personnel notwithstanding, 30 of the 45 respondents (66.6%) indicated they filled all their new hire positions last year. Ten people (22%) did not fill those positions, and five interviewees (11%) had none to fill.

Whether or not they were successful in filling their new hire positions, most managers cited traditional recruitment methods as those on which they had relied: newspaper advertising, search firms, referrals, internal employees, personnel agencies, walk-ins, DP schools and local colleges.

Among those who were successful in filling [illegible] there were two noteworthy [illegible] exceptions to the [illegible] recruitment techniques [illegible] Lace smiled [illegible] vice-president [illegible] services at Scot Lad Foods in Lansing, Ill. [illegible] Wisconsin Steel Corp. [illegible] down last summer [illegible]



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Compare Morrow Designs' (M10 and M26) hard disk systems to any system available for S-100 or Cromemco machines. First compare features. Then compare cost per megabyte. The M26 works out to under $200 a megabyte. And the M10 is about half the cost of competing systems.

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Both the M10 (8") and the M26 (14") are delivered complete with disk controller, cables, fan, power supply, cabinet and CP/M operating system. It's your choice: 10 Mb 8" at $3,695 or 26 Mb 14" at $4,995. That's single unit. Quantity prices available.

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The M26 and M10 are sealed media hard disk drives. Both S-100 controllers incorporate intelligence to supervise all data transfers through four I/O ports (command, 2 status and data). Transfers between drives and controllers are transparent to the CPU. The controller can also generate interrupts at the completion of each command — materially increasing system throughput. Sectors are individually write-protectable for multi-use environments. North Star or Cromemco?* Call Micro Mike's, Amarillo, TX (806) 372-3633 for the software package that allows the M26 and M10 to run on North Star DOS, MICAH or [illegible]

Morrow Designs' 26 megabyte hard disk system: $4,995.

[illegible] projects.

[illegible] would not [illegible] new re-[illegible] [illegible] the fu-[illegible]

Employment: The '80 Outlook

(Continued from Page 40)

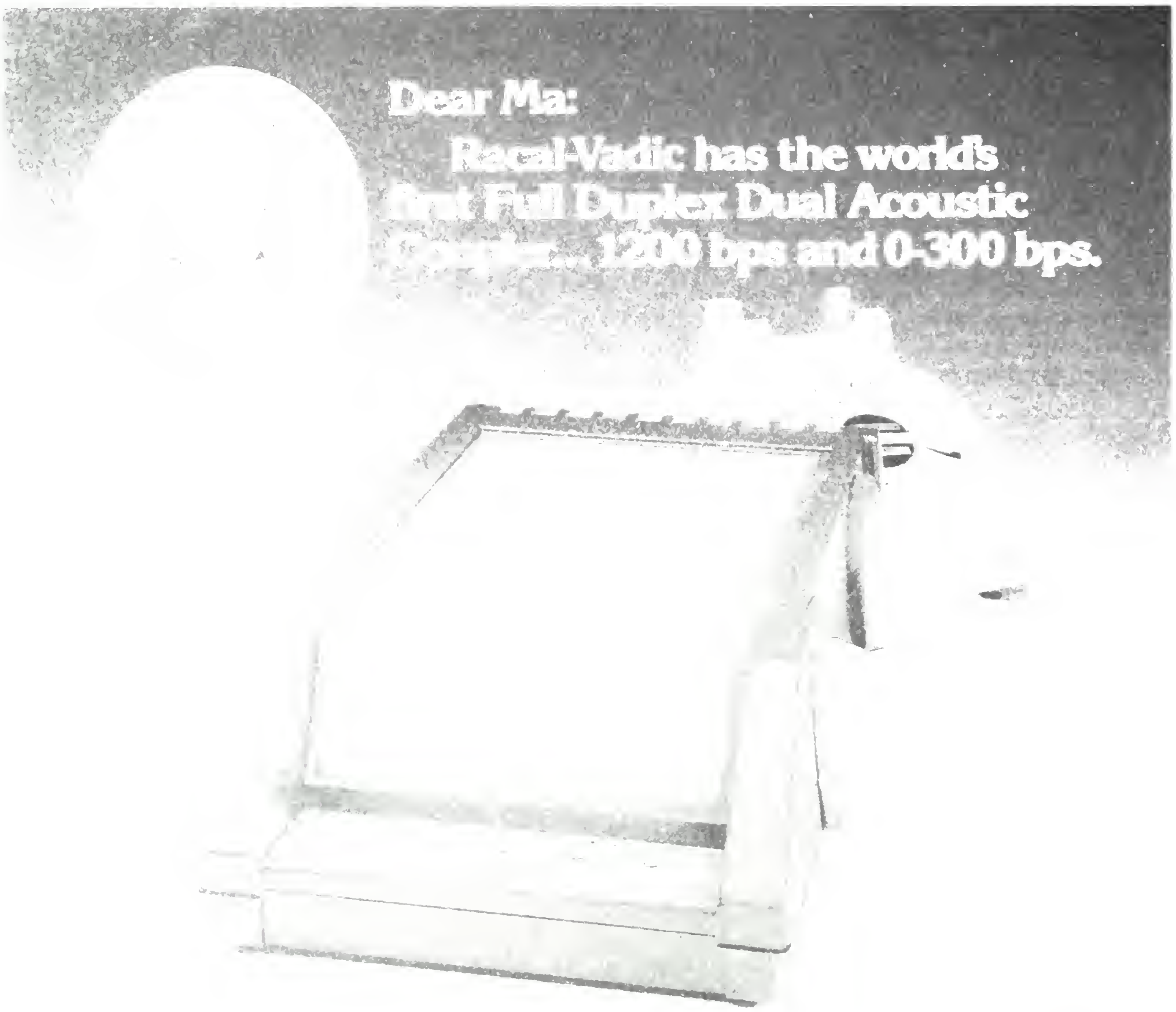
areas over the next decade.

We should also see an extremely high demand for DP professionals in the energy industry, currently one of the country's fastest growing business segments. The Labor Department projects an 80.0% increase in DP jobs in oil companies and mining firms, as well as in companies involved with the search for alternate energy sources.

City, state and federal governments will also provide an ever-increasing number of jobs for DP professionals (up an estimated 77.5% by 1990), as will financial, real estate and insurance firms (up [illegible] 1990), manufacturing [illegible] 72.5% [illegible] con-[illegible] up [illegible] The [illegible] and [illegible] [illegible]

Demand for Auditors

[illegible]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While [illegible] mation needs [illegible] fully integrated [illegible] provide for [illegible] cations as well [illegible] voice and data [illegible] there yet. To [illegible] first steps toward [illegible] ning to integr[illegible] cessing.

Just what is [illegible] tion of word pro[illegible] is difficult to [illegible] concepts popu[illegible] by catchy buz[illegible] tion has conno[illegible] ular situations [illegible] vendors view [illegible] context of their [illegible] desires or fears [illegible] and operation [illegible] economic and [illegible]

DPers have [illegible] cessing and [illegible] the early days [illegible] shared process[illegible] just like any oth[illegible] usually subord[illegible] Implementation [illegible] text editing and [illegible] multipage docu[illegible] little emphasis [illegible] of the more [illegible] common to oth[illegible]

DP manuf[illegible] WP at all [illegible] some large [illegible]

Murphy is [illegible] Decisions [illegible]

[illegible]

SYSTEM	WORD PROCESSING FEATURES	[illegible]
Word Processors	• [illegible] • [illegible] • [illegible]	[illegible]
Data Processors	• [illegible]	[illegible]

[illegible] DP product fam- [illegible] medium to large [illegible] with primary in- [illegible] batch processing as well [illegible] of these systems on

[illegible] integrated WP [illegible] Other vendors [illegible] DP [illegible] who [illegible] systems include Digital Equipment Corp., Basic [illegible] Corp., [illegible] Data Sciences Corp. and Prime Computer Inc. WP [illegible] vendors who offer shared-[illegible] systems with DP capability include CPT Corp., Lexitron Corp., Micom Systems Inc. and Xerox Corp. [illegible] a somewhat unique approach to integration with respect to features and functions provided and the ability to support ancillary electronic office operations. These then form the basis of integrated WP and DP in the early '80s.

WP/DP Checklist

The following checklist should serve as a guide to evaluating systems and their applications in a specific user environment.

- How large an operation is to be integrated? If a small single-terminal facility is envisioned, will dedicated word processing (WP) and data processing systems better support work loads when compared to a single system offering WP/DP integration features?
- In multiterminal, multiuser installations, is concurrent word and data processing supported on the system? If so, can WP or DP operations be run on the same terminal, or are dedicated function terminals employed?
- Can WP and DP files be accessed and transferred from a terminal that is in either operational mode?
- Are complete WP features and functions supported? Does the system provide equal WP capability when compared with a dedicated system: Do the termninals employed in WP offer user-friendly key arrangements and menu prompts?
- How complete are DP features and functions when compared with user needs for data base, data entry, transaction processing, batch processing operations and so forth? What languages are supported? Can programs be assembled on the system? What applications packages are supplied?
- How complete are communications and networking functions? Are various terminal and system emulators and protocols supported?
- Does the system offer ancillary electronic office-type functions such as electronic mail, electronic filing and electronic calendar scheduling? Is photocomposition supported?
- What upgrade or expansion paths are offered? Can the system be installed small and then migrated to larger configurations?
- How much experience does the vendor have in servicing an end-user market? Can the vendor adequately support or provide the degree of handhold that is often required by non-DP office operators?

The above checklist also provides a composite view of the full capabilities of systems expected in the mid-1980s.

[illegible] CYBORG PAYROLL/PERSONNEL SYSTEM RUNS ON ALL OF THESE.

[illegible] supported [illegible] personnel system [illegible] leading-edge [illegible] built [illegible] efficient [illegible] up and running for [illegible] organizations and [illegible] than 4,000,000 [illegible] popular

in Canada and the USA.

As a matter of fact, we've recently opened offices in California and Canada to better serve those customers. As the benefits of the system become more and more well known, we'll be expanding into more and more areas.

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[illegible] INC.

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INDUSTRY OUTLOOK:
CAN DP VENDORS WEATHER THE STORM?

Although the computer industry [illegible] weathered the 1980 [illegible] unscathed, companies [illegible] themselves for furt[illegible] 1981 by a troubled Euro[illegible] and spiraling interest rates [illegible]

Vendors and analysts [illegible] doom and gloom predictions [illegible] but can best be des[illegible] tiously optimistic [illegible] sometimes can be interpre[illegible] ing one's fingers [illegible]

Most mainframers [illegible] dip below 1979 lev[illegible] during the year [illegible] reporting flat earni[illegible]

With inflation expected [illegible] 12% next year and [illegible] anticipated to top [illegible] the first quarter of [illegible] pliers may continue [illegible] earnings pinch for the [illegible] year, some analysts [illegible]

Order rates are [illegible] ing the first quarter [illegible] tained William [illegible] president of Kid[illegible] Inc. Datapoint [illegible] strong order gains [illegible] year, experienced [illegible] the third quarter [illegible] in European markets [illegible] most firms depend on [illegible] nues from overseas [illegible] times up to 40% [illegible] crunch in Europe [illegible] U.S. computer firms [illegible]

Last year the strength [illegible] pean market masked [illegible] orders by U.S. customers [illegible] was one company whose [illegible] formance was [illegible] ropean gains [illegible]

Besides the economy in Europe [illegible] there have become more nationalistic [illegible] increasingly preferring to [illegible] cal companies, analysts noted [illegible]

While order recovery in the U.S. [illegible] expected to mask the impact of the Eu[illegible] ropean slowdown during 1981 [illegible] interest rates and a general [illegible] consumers that another recession [illegible] be on the horizon could put a damper [illegible] on the expected gain in orders, particu[illegible] larly on low-end systems [illegible]

This phenomenon [illegible] continued [illegible] which depressed 1980 earnings [illegible]

Blumenthal [illegible] *at CW*

[illegible] at all software and [illegible] processing features [illegible] Gehring [illegible]

[illegible] IBM is expected to make mo- [illegible] small-system products the [illegible] also pursue software reve- [illegible] more aggressively in the [illegible] Easterbrook estimated [illegible] IBM [illegible] up to 5% of its reve- [illegible] software next year and could [illegible] during the next couple of [illegible] by Shearson Loeb [illegible] Rhoades [illegible] noted IBM's software [illegible] from the 4300 series could [illegible] revenues equal to those from that hardware and that sales of H series software could be 25% to 50% of the hardware volume.

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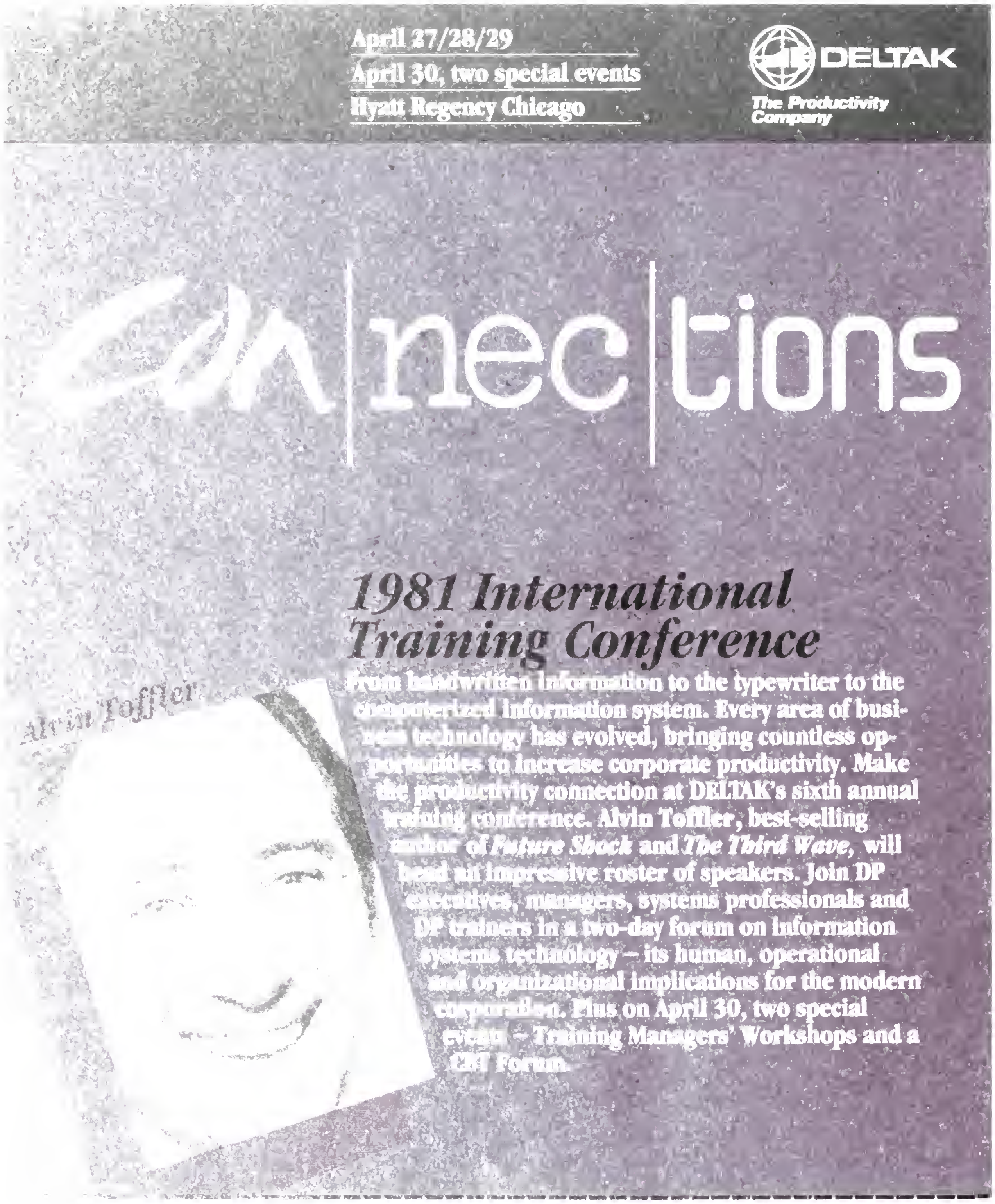

1981 International Training Conference

From handwritten information to the typewriter to the computerized information system. Every area of business technology has evolved, bringing countless opportunities to increase corporate productivity. Make the productivity connection at DELTAK's sixth annual training conference. Alvin Toffler, best-selling author of *Future Shock* and *The Third Wave*, will head an impressive roster of speakers. Join DP executives, managers, systems professionals and DP trainers in a two-day forum on information systems technology – its human, operational and organizational implications for the modern corporation. Plus on April 30, two special events – Training Managers' Workshops and a CBT Forum.

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Independent Software Firms

This aggressiveness is bound to put a pinch eventually on the independent software companies who compete in the mainstream of IBM products. "These vendors will be impacted as IBM puts a lot more options and features into its IMS and CICS products," remarked David Eskra, president of Pansophic Systems Inc.

Pansophic specializes in information retrieval and library control systems, but doesn't see too serious a challenge from IBM in this arena.

Besides IBM, Eskra noted 1981 may prove to be highly competitive among independent software firms. "There will be a lot more competition for the software dollars at user sites with the overall software budget dollar leveling out," he observed, and users who have to make a decision between a utility or application package may make their decision on which package to purchase based upon which vendor "gets to the door first."

While IBM will certainly put the pressure on independent software firms, its ability to compete may be hampered by its size, suggested Alex Kuli, marketing director for Cincom Systems Inc. IBM may have a difficult time creating new software products until it breaks up its software development operations into smaller, entrepreneurial units such as existed with the creation of DOS. If IBM makes this transition it should have the clout to dominate the market, he predicted.

To help retain its competitive edge, next year Cincom intends to make the use of its data base management systems less complex and allow word processing information to be hooked into the data base, Kuli said.

On-Line English

Cullinane Corp. will also continue developing tools to allow speedy applications development on its IDMS system. In addition, the firm will provide more tools such as On-Line English, which allows a nonstructured access to the data base for inexperienced users, according to Robert Goldman, senior vice-president of product development.

Moreover, Cullinane is developing or adapting standard application packages for use with IDMS.

With inflation continuing, users can expect to see price adjustments in its products. However, ADL's Withington does not think price increases will be very steep. "IBM has improved earnings under its current price umbrella."

And no forecast for the new year could be complete without remarking on the threat the Japanese present the mainstream computer industry. Although selling its products on an OEM basis to NAS, Amdahl and others, analysts and vendors interviewed expect to see the Japanese at most make a miniscule impact on the industry. Any inroads will be on the very low end such as personal computers, observers agreed.

VENTURE CAPITA
NONSENSE FOR HIG
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[illegible] Inc. [illegible] ative [illegible] public [illegible] firms [illegible] capital- [illegible] are [illegible] profit [illegible] entre- [illegible] product [illegible] [illegible] capital [illegible] nology investments are being asked to make commitment decisions too quickly, observed Henry McCance, a general partner in Greylock Management Corp. This leads to shortchanging the evaluation process, which is tantamount to a violation of good management practices, McCance warned.

Despite these warnings, Sutter Hill's Draper sees 1981 as a promising year for venture capital investment. New start-ups have not yet become too high priced. In funding start-ups the venture [illegible] offers more than capital, often providing consulting to the firm, putting together its management team, evaluating the market for a particular product and making introductions for the new firm in the financial world.

Although start-ups may still be reasonably priced, many venture capitalists noted the second and third financing is where the competition is. One firm sold its start-up shares for $1 apiece, but managed to obtain $5 per share from venture partners on a subsequent financing.

Although high-technology start-ups often require the infusion of venture capital, such firms can opt for venture financing at various times during their development.

Relational Technology, Inc. is an example of a new start-up firm that sought funds immediately. Integral Data Systems, Inc., on the other hand, is a profitable firm with $10 million in revenue, which sought venture financing for the first time only recently. That firm raised $1 million.

Still a third — Priam Corp., a two-year-old disk drive manufacturer — is now in its third round of venture funding (see related stories).

Within the venture capital arena the most active segment is the 200 private partnerships and firms that hold between $1.5 billion and $1.8 billion of the total venture capital assets. During the past [illegible] years some 15 to 20 partnerships have been formed annually. [illegible] partnerships [illegible] 1977.

[illegible] segment is the 330 or [illegible] small business investment companies [illegible] one-third are [illegible] The [illegible] billion in venture capital assets.

[illegible] AIC's [illegible] Gives You The Ultimate Computer Language...

PLAIN ENGLISH!

```
[illegible] SALESMEN HAVE THE HIGHEST PERCENT OF QUOTA IN
[illegible] REGION?

                                             1980
          LAST          FIRST                 YTD
[illegible]  NAME          NAME          %OF QUOTA

[illegible]  SMITH         MARY              92.57
[illegible]  KATZ          MARY              92.71
[illegible]  JOHNSON       JAMES             88.09
[illegible]  NIXSON        BRAD             146.91
[illegible]  HASTINGS      STEPHEN           93.49
[illegible]  ARNETT        ROBERT            90.52

     [illegible] AND WESTERN REGIONS: SHOW ME
     [illegible] THIS YEAR AND LAST YEAR.

                  1980          1980          1979
   [illegible]     YTD           YTD        ANNUAL
   [illegible]  %OF QUOTA       SALES         SALES

   [illegible]    92.57      $647,974      $820,710
   [illegible]    90.52      $633,630      $763,506
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Integral Data Systems, Inc.

[illegible] Data [illegible] funding [illegible] Ven- [illegible] M [illegible]

[illegible] used with [illegible] The prod- [illegible] sell [illegible]

[illegible] $3.5 million [illegible]

[illegible] VanderMey decided [illegible] capital funding and received $1 million from Greylock Management Corp. and [illegible] Venture Associates. These investors have [illegible] understand the [illegible] problems [illegible] business, VanderMey noted. The company had previously financed its growth from retained earnings but wanted to establish banking [illegible].

Although the venture financing was the company's first, it was like second-round financing because the owners did not have to yield much of their equity.

There are 6 key factors for su[illegible]

CONTROL V[illegible] INTEGRA[illegible] DATA DICTION[illegible]

Cullinane has made the Integrated [illegible] completely integrated database managemen[illegible] important difference between IDMS and others [illegible] others still talk about it as a concept.

IDD, the active data dictionary, aut[illegible] tents, assuring accuracy and cons[illegible] unique facility of IDD automatically [illegible]

The Integrated Data Dictionary give[illegible] of "data about data," providing [illegible] sources, both automated and man[illegible]

The IDD [illegible] standards for [illegible] programs and files. This assures th[illegible] same definitions to describe the same [illegible] munication between data process[illegible] user department.

And the IDD maintains relat[illegible] tems, users, programs and data elem[illegible] Because of this it can monitor the [illegible] proposed [illegible] changes on the [illegible] in advance.

IDD is the integration point [illegible] winning DBMS, IDMS, facilitating [illegible] cation development, end user [illegible] data and efficient processing [illegible] environment. The IDD is an [illegible] in the growing complexity of t[illegible] typical computer operation[illegible]

Attend a free seminar on IDMS, the dictionary-driven DBMS which meets the six key factors for success in database systems.

C

Databa[illegible] System[illegible]

Free Seminar[illegible]

Learn about the other 5 key factors for success in database systems [illegible] management seminar on IDMS and the complete family of software systems [illegible]

Dates and Cities

JANUARY
7 [illegible]
8 Dallas [illegible]
8 New York [illegible]
13 [illegible]
13 Los Ang[illegible]
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15 Hartford [illegible]
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15 M[illegible]
15 [illegible]

FEBRUARY
[illegible]

Database: Cullinane

NETWORK ARCHITECTURE:

[illegible] Related to this [illegible] VM/370 operating [illegible] be enhanced [illegible] VM/370 Sys- [illegible]

puter scientist, the main problem in tuning SNA to X.25 — the problem IBM may solve for domestic customers next year — is SNA's path control sublayer.

Incompatible with X.25, this sublayer breaks messages into packets and adds both addressing and sequencing information to each packet. This determines which node in the network each packet will visit next and how the packet is to be combined with other packets to reconstruct a message.

SNA's bit-oriented Synchronous Data Link Control (SDLC) protocol is a functional subset of the High-Level Data Link Control (HDLC) protocol contained in X.25 and which forms the second layer of the ISO's model architecture, Power noted. But the path [illegible] gives IBM two [illegible] the nation's SNA [illegible]

[illegible] black box [illegible] between SNA and X.25 [illegible] SNA's [illegible] Power observed [illegible] appealing [illegible] even [illegible]

[illegible] Canada [illegible] X.25 translation [illegible]

[illegible] for SNA users is claimed to void the distinction between 3270 terminals directly connected to IBM mainframes and those terminals linked to X.25 packet networks.

Using popular terminology, the ISO

SNA vs CHALLEN [illegible]

model s lowest [illegible]
the lines between [illegible]
second layer, HDLC [illegible]
of data packets [illegible]
third layer, X.25 [illegible]
of entire message [illegible]
Awaiting [illegible]
transport [illegible]
sages from end-[illegible]
fifth layer [illegible]
cal sessions [illegible]
tion, maps [illegible]
seventh layer [illegible]
information [illegible]

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seled [CW [illegible]]
net situation [illegible]
simply [illegible]
nets and run [illegible]
utility

Most universities and [illegible] computer science programs [illegible] projects in local net design [illegible] thing a college campus is [illegible] might say — a text-book setting for such a facility.

Workers in academic buildings can benefit substantially from easy message-switching on circuits not in thrall to telephone companies. And the expertise needed to string up and maintain a local net is often available from modestly paid faculty, students and the plucky crew of technicians

[illegible]

[CW [illegible]]

IEEE [illegible]

Ethernet [illegible] for [illegible]

transmission, the IEEE wants [illegible]

dard. [illegible]

tively settled on 1M, 5M, 10M [illegible]

20M bit/sec [CW Dec. [illegible]]

A few weeks after DEC, Intel and Xerox released specifications [illegible] Ethernet [CW Oct. [illegible]], Satellite Busi-

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USER vs VENDOR: THE LEGAL BATTLES [illegible]

Their sales [illegible] age-old foot-[illegible] an occasional [illegible] hand.

And while they [illegible] eotypical loud [illegible] sideshow [illegible] chance, they w[illegible] product that [illegible] payroll, but [illegible] bed at the end [illegible]

Like the mach[illegible] computer sales [illegible] sophisticated and [illegible] state-of-the-art [illegible] sales pitch. But [illegible] most of them [illegible] dance sales routin[illegible] when cavemen [illegible] skins marketed [illegible]

In the past [illegible] users have filed [illegible] claiming they have [illegible] precontractual [illegible] cently, a precedent [illegible] history when a major [illegible] facturer was actually [illegible] fraud for misrep[illegible] capabilities.

Just a few months [illegible] actions of a [illegible] against a major vendor [illegible] into a blizzard of [illegible] lawsuits claiming [illegible]

Unfortunately [illegible] the courts, users are [illegible] is a lot more difficult [illegible] malfunctioning computer [illegible] return that oversized [illegible] sweater. And things will [illegible] ficult in the future, especially for [illegible] user who puts more faith in the salesman's spoken words than what he signs for on the dotted line.

"When you're dealing with large organizations with complex products to sell [the salesmen] get pressures and quality control is not what it should be," according to Samuel B. Harvey, a senior vice-president with RHS & Associates, Inc., a New Jersey consulting firm. "Whether it's computers or anything, there's going to be guys who will sell somebody something that they don't need."

When a user is stuck with a malfunctioning system beause he was undersold or oversold on what the machine [illegible]

[illegible] applications [illegible] purpose [illegible] contract [illegible] puter as [illegible] it performs [illegible]

All the things [illegible] put [illegible] initial proposal [illegible]

Scannell is senior editor, hardware, at CW.

[illegible]ndard
[illegible]ology

DATA
SYSTEMS
SERVICES

[illegible] CNReports [illegible] hosting [illegible] CNReports [illegible] Com- [illegible] calculation [illegible] some [illegible] In fact [illegible] The [illegible] same [illegible] cause [illegible] of the [illegible] appear in [illegible] Auer ad- [illegible] better [illegible] wants [illegible] during the [illegible] the con- [illegible] get the [illegible] they'll [illegible] added [illegible] grandiose [illegible]

Users Beware

[illegible] be particularly [illegible] vendors who will [illegible] next few [illegible] be extremely [illegible] because the [illegible] contrac- [illegible] software or hardware [illegible] rough of [illegible] This little [illegible] guys work- [illegible] next to a [illegible] he continued. [illegible] system does not work [illegible] what does the [illegible] decides to bring the [illegible] does he sue?

The [illegible] deal in some ways is [illegible] for anybody to be con- [illegible] except the poor guy [illegible] in the teeth," he said. [illegible] there have been an increased number of these type of cases [illegible] the past six months.

[illegible] the doom and gloom [illegible] the first-time computer user [illegible] the very vulnerable small business person — there are some rays of hope. Influenced by user criticisms and growing mistrust of the industry [illegible] number of vendors have instituted [illegible] hand- [illegible] customer relation- [illegible] instance, Data General [illegible] several first-user manuals on the subject of computers [illegible] conspicuously devoid of self- [illegible] back-slapping. And companies [illegible] IBM and Digital Equipment Corp. [illegible] 24-hour toll-free hotlines [illegible] used to ask questions directly to the firms' technicians and system [illegible].

While these seem like nice gestures, CNReports' Auer believes that the vendors are increasing hand-holding tactics because the competitive market necessitates it rather than doing it out of the goodness of their hearts.

Contract Advice

Finally, there are several things a potential user can do to combat what one chief executive officer of a major computer firm currently involved in a precedent-setting lawsuit called "the number one cause of all present and future computer litigation — the young, aggressive and over-eager salesperson."

First of all, get both the vendor and user sides clearly defined in the contract down to generic responsibilities, task levels and implementation schedules, Editor Auer said. "Vendors don't mind negotiating this type of contract because they like to know what their specific responsibilities are . . . and what the users are going to do. And they also like to know when they're through."

Contract lawyer Segelstein simply advises to listen very carefully to the vendor. "Every piece of paper he hands you, every statement he makes, you write down and memorize it someway. And then try to get it in the contract."

When courting vendors, a buyer should be seductive yet firm, Segelstein continued. He should also not be afraid to push too hard or threaten to drop the vendor if his demands are not met. "A lot of large vendors will turn tail and run at the first sign of a pushy customer and concentrate on the fellows who are ready to sign on the dotted line" — which is just as well for the cautious buyer.

As negotiations reach the wire, get the vendor to spend a little time and money by setting up machine demonstrations and scheduling visits to similarly equipped shops. "The vendor is less likely to walk away after he has dedicated marketing time, energy and money," Segelstein observed.

Finally, the neophyte user should prepare for the worst, or at least a rollercoaster-like sales ride, before opening up the vendor catalogs and selecting that cute little dream system. Unlike fairy tales, where computers are concerned, there is no such thing as "living happily ever after."

"I see people getting told that computers are the greatest thing since sliced bread," Segelstein said. "And a year later, after the system has died four times over and they're ready to chuck it out, they realize — they are in data processing, and this is what data processing is all about."

Introducing the HP 2675 portable terminal: power on the move.

You [illegible] a portable [illegible] terminal [illegible] The HP 2675 [illegible] true local workstation that lets [illegible] entry and retrieval, editing [illegible] gramming — off-line or anywh[illegible] there's a phone handy!

Performance to go.

Mass storage on a portable terminal? Absolutely. The 2675's high-speed, high-density cartridge tapes even reduce waiting time and optimize storage space. And the advanced editing features let you update recorded information as well as make corrections before sending data to the computer.

The 2675 is also remarkably easy to operate. It uses friendly, English-like commands, and has a familiar, typewriter-style keyboard with eight soft keys you can define yourself. Once you've tailored the terminal to your application, those configurations [illegible]

It makes communications a snap.

With bo[illegible] port, you can configure [illegible] transmission speeds [illegible] 300 [illegible] baud [illegible] message acco[illegible] with a [illegible] connected to [illegible]

What's more [illegible] and a tool [illegible] the terminal's [illegible]

If you thought Last year's DECsystem-10s and 20s were easy to use, take a look at this year's.

decsystem10

[illegible] is changing the way [illegible] think about big computers.

[illegible] big computers have led the [illegible] multi-user applications. Simply [illegible] quickly and manage them [illegible] computer power to a wide [illegible]

[illegible] new enhancements [illegible] -20s and DECsystem-10s [illegible] easier to use than ever

[illegible] development time

[illegible] to the TOPS-20 operat- [illegible] programmers can efficiently re- [illegible] high-speed video terminals [illegible] a wider range of file organi- [illegible] COBOL and new debugging [illegible] FORTRAN for still higher [illegible]

[illegible] system management

[illegible] the most out of your CPU [illegible] adjust a [illegible] meet actual demand [illegible] of the easiest-to-use [illegible] management Systems in the [illegible] overhead system that's [illegible] RP20 disks [illegible] more accessible [illegible] large number [illegible] powerful tool [illegible] management jobs

Increased uptime

And to make sure your applications keep running smoothly, Digital continues to improve service and support. We now have more than 14,000 service people in over 400 offices worldwide. We've revised documentation and training material to simplify the job of system managers. And our latest RAMP (Reliability And Maintainability Program) features include additional TOPS-10 automatic system recovery capabilities, comprehensive diagnostic facilities, and less overall operator attention to make the system run.

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The corporate
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[illegible] opponents of the bill [illegible] bring it up again early in [illegible] Congress. But [illegible] sugges- [illegible] measure should also be [illegible] by the Judiciary and Intelli- [illegible] indicates the task [illegible] privacy proponents face [illegible]

Players Lineup

[illegible] agencies have long [illegible] players in some of the [illegible] information policy debates in [illegible] and the Republican sweep [illegible] will do little to change [illegible]

One example: Congress for years has wrestled with the question of whether to permit the FBI's National Crime Information Center (NCIC) to implement a message switched telecommunications system to transfer computerized criminal histories between state and federal law enforcement authorities.

Civil libertarians, who have long argued the NCIC proposal smacks of a "Big Brother" national police system, are now openly worried the new conservative Congress will readily embrace any law and order proposals and will give the FBI and other law enforcement agencies carte blanche to develop their technological capabilities.

Viewing the electoral defeat of liberal senators such as Birch Bayh (D-Ind.) and John Culver (D-Iowa), one Senate Judiciary Committee source put it this way: "Civil libertarian-wise, you can pack up the game; it's all over. No question about it, the FBI will get whatever they want."

Presumably this will include beefed-up NCIC systems and stalled (or at least watered down) privacy legislation.

That, of course, is an admittedly worst case scenario. Other observers [illegible] the big unknown in the privacy debate is the philosophies of incoming legislators. Many of the newly elected Republican senators and representatives, it should be remembered, [illegible] a states' rights attitude which may tend to temper intelligence community bids for powers that could be [illegible] constituting federal interference in state law enforcement activities.

[illegible] as one White House adviser noted recently, Congress has been seriously embarrassed by the revelations [illegible] congressional bribe-taking related [illegible] FBI's so-called Abscam operation [illegible] may not take kindly to any FBI proposal. According to this theory, [illegible] Congress will be greatly interested in privacy, if only for self-[illegible]

[illegible] new administration and Congress approach these federalism issues will affect a number of issues relating to technology and law enforcement. The Transportation Department [illegible] to implement a national message-switched telecommunications system to beef up the National Driver Register to track illegal [illegible] just one example.

[illegible] the federal computer [illegible] by congressional at- [illegible] rewrite the entire federal [illegible] The FBI has vowed to [illegible] bill despite the opposition [illegible] state law enforcement [illegible] and despite the fact the [illegible] sponsor, Sen. Abraham [illegible] is retiring from office.

Increasing Efficiency

[illegible] law enforcement issue — [illegible] and abuse in federal [illegible] Congress and federal [illegible] steadily increasing [illegible] to employ sophisticated technology.

[illegible] computer matching pro-

[illegible] 3000 32-bit multiprocessor system

Now you can grow by plugging in resources instead of changing computers

[illegible] BTI [illegible] 32-bit CPU [illegible] system [illegible]

[illegible] TRANS [illegible]

[illegible] 2,500 [illegible] U.S. [illegible]

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SYSTEMS

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So when the CRT
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And get th
Terminals, Inc.
Tel.

[illegible] and spread [illegible]

[illegible] Pre- [illegible] to [illegible] and [illegible]

[illegible] years at the [illegible] attempts to [illegible] issues spearheaded [illegible] for more privacy legislation [illegible] coordinated U.S. response [illegible] -border data flow problems [illegible] just a few of his initiatives.

[illegible] Preyer project was taking the U.S. Postal Service (USPS) to task [illegible] Zip Code scheme. [illegible] largely to his efforts, the House and Senate agreed two weeks [illegible] the new Zip Codes until [illegible] 1981.

The [illegible] measure, which would [illegible] both houses to more [illegible] Postal Service [illegible] automation [illegible] cut costs, [illegible] adjournment [illegible] wrangling of the 96th Congress. [illegible] the widespread support the measure gained on both sides of the Hill seems to assure that the new Congress will take a long look [illegible] Zip Code expansion program.

The Zip Code expansion plan is just one of several postal technology issues Congress is expected to take up next [illegible]. Its proposal to enter the electronic mail marketplace is expected to come before the Senate Communications Subcommittee some time in 1981.

How Congress will go on the Postal Service's Electronic Computer-Originated Mail (Ecom) proposal is not clear at this point, but there has been considerable lobbying by private industry to at least limit Postal Service involvement in the types of telecommunications services private firms are [illegible] to offer.

Early Indications

Perhaps indicating the new administration's stance on Ecom, former FCC chairman Richard Wiley, now heading the Reagan transition task force at the Justice Department, said recently, "if private industry can do the job, the government ought to get out; this extends to USPS as well."

If Wiley's philosophy is echoed by [illegible] in the Administration, it could bode well not only for the U.S. telecommunications industry but also for vendors of on-line data bases and other sophisticated information services that are currently fighting to keep the government from competing with them.

One [illegible] communications issue that [illegible] of greater emphasis in 1981 is that of trans-border data flow. After extensive congressional hearings and a House subcommittee investigation, Preyer introduced a bill that would drastically restructure federal [illegible] in responding to data flow problems encountered by U.S. firms [CW, D[illegible] 15].

Although Preyer was not reelected and the bill was introduced too late in the session for the 96th Congress to act on it, there is reportedly enough bipartisan support for it to move forward in

(Continued on Page 66)

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SEED supports both [illegible] logical data structures and allows data base [illegible] COBOL or FORTRAN. It utilizes a CODASYL [illegible] approach to enable your users to easily and confidently [illegible] SEED to develop new applications. You will also be [illegible] to learn that SEED has been written in a combination of FORTRAN (for transportability) and Assembler (for efficiency).

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We would be interested [illegible] SEED might be able to [illegible]

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[illegible]

communications technology and information policy" will help prepare the Senate and House for debates on a number of different information issues.

And in the long run, the sophistication of all members and committee staffs of Congress will determine how information issues progress during the next several years. According to transition team member Wiley, Capitol Hill staffs are already "light years ahead" of where they were only a few years ago in being able to understand and handle information issues.

The significance of that remark can be gauged by keeping in mind that it is the staffs, both on Capitol Hill and in the executive agencies, that handle most of the particulars of complicated issues such as those of information policy. It is often they who educate members of Congress and the Cabinet [illegible] importance of these issues.

[illegible] is currently the No. 1 [illegible] Both [illegible] the in- [illegible] Republican [illegible] subcommittee staff positions are turning over. The same process is going on on the House side, where 74 new members take office in January.

But the 4,000 or so Capitol Hill positions changing hands pale in significance when compared to the turnover in the agencies, where at least 10,000 people will be brought in through political appointments and to fill jobs left vacant by the retirement and transfer of high-level civil servants.

The possible demise or downgrading of the Preyer information subcommittee and the rumored breakup of the National Telecommunications and Information Administration, which serves as the President's chief communications adviser, only add to the uncertainty of those concerned with federal information policy.

Corporate Model

In the final analysis, every one of the information issues mentioned above is up in the air. Much will depend on where the longtime staffers who have been fighting for these issues end up in the administration and Congress, whether they remain to push the issues on the new cabinet and congressional committees or are lost in the bureaucratic shuffle being orchestrated by Reagan and the new legislators.

On the administration side of the equation, one close Reagan adviser, former Diner's Club chairman Alfred S. Bloomingdale, was quoted recently as saying "running the government is like running General Motors." Indeed, the president-elect is staffing his administration as one would a large corporation.

What this will mean for information issues is at the moment unclear. How the corporate executives, supply-side economists and neoconservative politicians flocking to this city will approach information issues is as yet an unanswered question.

But if General Motors is truly to be the model for the new government, it should perhaps be noted that the giant auto maker currently advertises itself as the largest producer of computers in the world. Then again, General Motors is part and parcel of the same industry that brought us the Edsel.

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By Rita Shoor

[illegible] F SOFTWARE DEVELOPMENT

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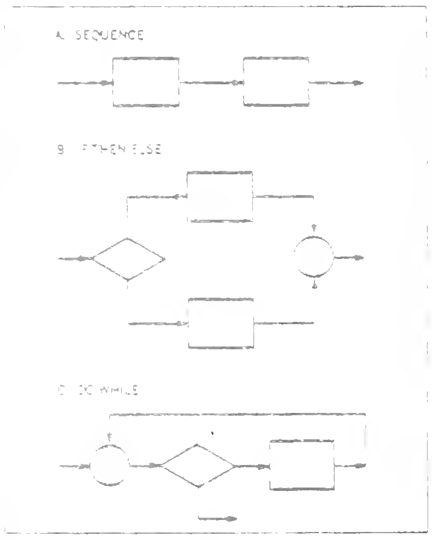

[illegible] basic and secret algorithms. While it is easy to alter a program's form and the accompanying [illegible], it is much more difficult to [illegible] the basic algorithm [illegible].

[illegible] was a recommendation to create an inventory of programming styles of the people who were involved in the original software development. This library could be used in spotting vestiges of [illegible] misappropriated software. He also suggested including [illegible] error in each program, a technique that has been used successfully by [illegible] publishers to de[illegible].

Finally, he recommended that the software creator produce a catalog of the software's functions and features and annotate this catalog by pointing out what potential extensions and/or modifications are merely that and not representative of novel development. While the features comparison is the weakest disproof of theft of trade secrets, he said, such a catalog might be useful as a counterargument.

SOFTWARE LITIGATIO [illegible]

CHICAGO — Trad [illegible] rights or patents [illegible] available for prot [illegible]

But which choi [illegible] yers from all over [illegible] the recent Nation [illegible] tion Conference [illegible] seemed to be that [illegible] law offers the [illegible] tion, it is essential [illegible]

The legal pr [illegible] with these [illegible] prompted by the [illegible] volving software [illegible] While the courts began [illegible] problem in 1950, as [illegible] U.S. Supreme Court [illegible] up two cases involvi [illegible] tion for the compu [illegible] Aug. 25], lawyers [illegible] ference predicted [illegible] ware litigation cases [illegible]

One reason for th [illegible] cases may be that [illegible] are "old legal techn [illegible] ing crammed and [illegible] needs of new techno [illegible] opinion of Roger Milgrim [illegible] adjunct professor of law [illegible] York University's Law School [illegible] spoke on "Trade Secret Law to [illegible] software."

While conceding that patent law, copyrights and trade secret law are less than perfect, Milgrim flatly told attendees, "If you're not interested in less-than-perfect legal solutions, let's all go home."

The shortage of programmers in a labor-intensive industry will make a secondary contribution to the number of times software has a day in court. A shortfall of approximately 50,000 programmers has been predicted for 1981. This would naturally lead to a severe shortage of new application software. Therefore, as Milgrim pointed out, the pressure to misappropriate, misuse or otherwise improperly channel proprietary software may reach a "distressingly high level."

Pro [illegible] (CW, Dec. [illegible] both patent [illegible] con [illegible] right [illegible] 1976 [illegible] How [illegible] delved more [illegible] tions of the [illegible] tions of the 1956 [illegible] drafted (CW, Dec. 15) [illegible]

Peter Maggs, a spec [illegible] law from the Univers [illegible] that many of its [illegible] sult from [illegible] that was 10 years [illegible] indicated [illegible] might be desired [illegible] a computer program [illegible] that makes obtaining [illegible] cret agreements impossible [illegible] its mode of distribution [illegible] complex software [illegible] crets.

If copyright law is less than sat [illegible] tory, patent protection does not [illegible] much better. Firms considering [illegible] applications for proprietary soft [illegible] might do well to consider court [illegible] sions for the last 10 to 15 years, Mil [illegible] grim cautioned. More than 70% of all patents adjudicated in court have been [illegible]

Rita Shoor is senior editor, software, at CW.

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advances of IBM's
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IBM has started delivering System/38's to customers.

And customers have started delivering comments like these to IBM.

"**I created a special equipment report in 15 minutes flat. Before, it would have taken a day and a half of programming.**" —Chuck Petter, Data Processing Manager, Road Machinery and Supplies Company, Minneapolis.

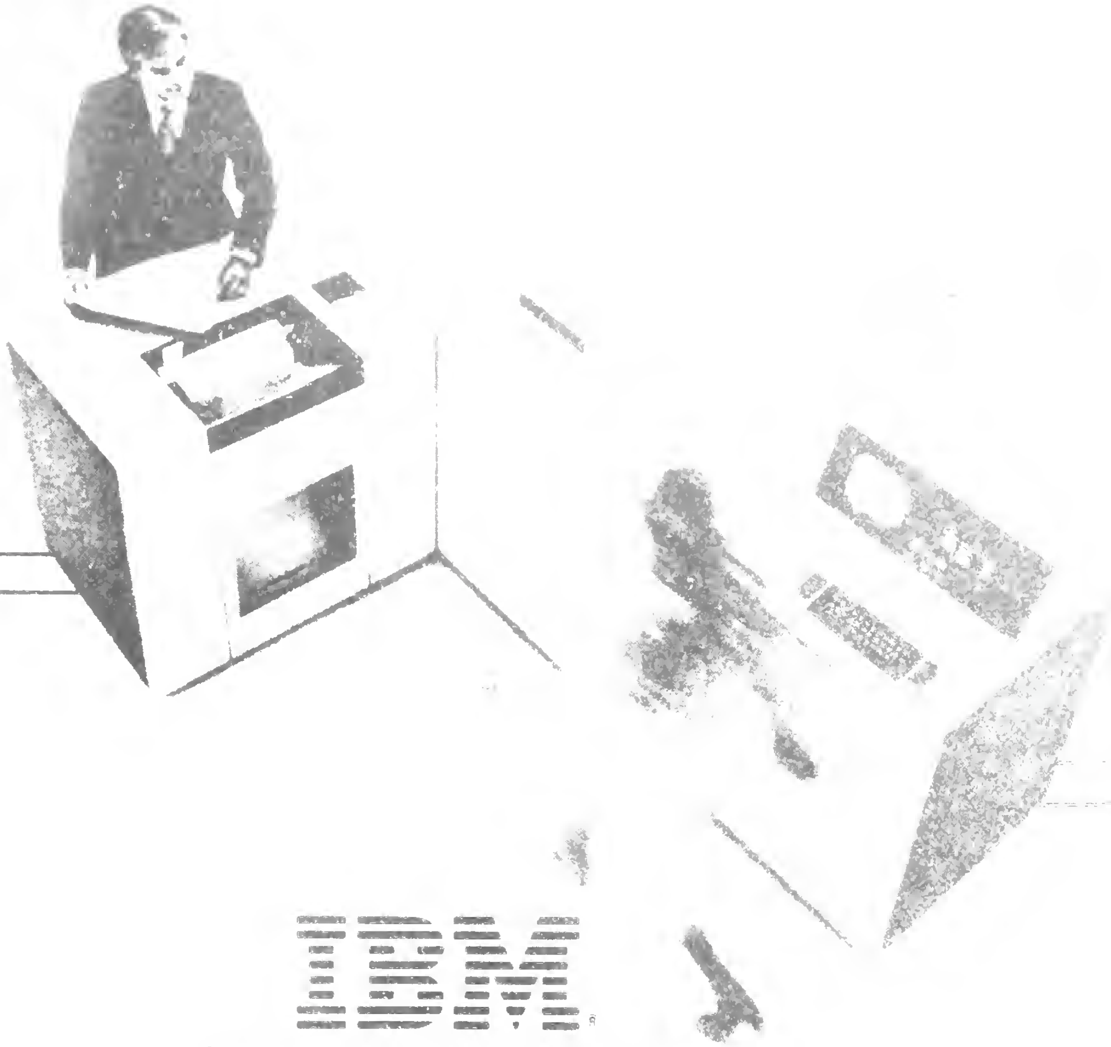
"**System/38 makes our programming staff more productive. We've developed applications in weeks instead of months. And they're more effective.**" —Norbert Gottenberg, [illegible] Planning & Management Information [illegible], United M[illegible] and Manufa[illegible], New York City.

"**The System/38 significantly reduces the amount of code necessary to write a program and the time and effort required to move into new applications. We're extremely enthusiastic.**" —L[illegible], Director of Data Processing, St. [illegible] College, Northfield, Minnesota.

And we're [illegible]astic, too.

Becaus[illegible] General S[illegible] Division's [illegible] new System[illegible] is a compact [illegible] system with [illegible]

many large [illegible] distributed [illegible] don't have to [illegible] ral data [illegible] [illegible]



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General Systems Division

[illegible]OGY TRENDS FOR THE BELL [illegible]TWORK: Interview With John S. Mayo

[illegible] Bell Labs re- [illegible] some time ago. Scanning- [illegible] satellites would be more selective [illegible] satellites. Rather than [illegible] signals over a wide area, [illegible] would use sharply focused beams to deliver digital signals to hundreds of [illegible] stations. And a gradual move to higher frequencies will give us more bandwidth, so satellites will be able to [illegible] greater number of signals simultaneously. The increased bandwidth also allows greater flexibility in handling digital signals.

We should also keep in mind improvements in the components that go into satellites. For example, our echo canceler chip has especially improved the quality of satellite-transmitted conversations. Right now, Bell Labs is making important advances in the design of gallium arsenide field effect transistors, which we're using in amplifiers for our terrestrial microwave systems. These transistors will also be used in satellite systems. And our research and development work with [illegible] continues to increase the useful lifetimes of communications satellites.

Bell Labs is working on light-wave communications systems that transmit light of lower frequencies, or longer wavelengths, than existing light-wave installations. How will these systems increase the usefulness of light-wave communication?

[illegible] loss [illegible] lower [illegible] between the [illegible] total [illegible] faster [illegible] eco- [illegible] light-wave [illegible] which uses a [illegible] being

Meanwhile, what is the future of the analog portion of the network? Will analog remain an important transmission technique?

Analog facilities have significant versatility — they aren't limited to transmitting only analog signals. We've been transmitting digits over analog

[illegible] And there's a [illegible] advantage in transmitting [illegible] in analog form [illegible] — voice, for instance [illegible] transmit voice signals [illegible] 4-kHz channel and get [illegible] There are some applications [illegible] with radio systems [illegible] bandwidth needed to [illegible] limits equipment [illegible] and makes digital transmission [illegible]

[illegible] involved in digitization of long-haul facilities via light-wave and satellites spans many years. During this period, our trans-

[illegible] satellite [illegible] nearly 20 [illegible] satellite communication [illegible] from systems now [illegible]

[illegible] mea- [illegible] capac- [illegible] possible [illegible] geographic [illegible] mission needs increasingly will be met by digital facilities, reducing the role of analog facilities in the network. But I don't see any places where anyone wants to go out and displace analog equipment or not use it to its fullest capacity. Quite the reverse. It will be used very effectively for many years to come.

The Bell System [illegible] **deploying a nationwide** [illegible] **software-controlled** [illegible] **larger than any** [illegible] **computer network** [illegible] **to achieving such a** [illegible] **gram controlled net**[illegible] **we still have to do** [illegible]

From the point [illegible] ogy, we are very [illegible] By that I mean that [illegible] circuits today are [illegible] stored program [illegible] systems, and in 19[illegible] trunks equipped [illegible] interoffice signaling [illegible] doubled. CCIS is [illegible] network that carries [illegible] connect information [illegible] program controlled [illegible] Back in 1965, we [illegible] program control [illegible] and a sizeable part [illegible] too, is now equipped [illegible] chines.

Are developments in hardware or software the stimulus to the stored program controlled network?

Both. Hardware and software are not as separable as they once were considered to be. Maybe the stimulus is a combination of the two in the form of systems architecture. Systems architecture — an extension of what we used to call systems engineering and systems design — considers both hardware and software. This unified approach accounts for much of the flexibility of the stored program controlled network when it comes to changing the network or updating it to meet new demands and to provide new services and features.

We hear a lot about the evolving Integrated Services Digital Network, which will further extend digital technology and services into the existing telecommunications network. What is the Integrated Services Digital Network, and what steps are being taken by the Bell System to implement it?

The Integrated Services Digital Network is more of a concept than an actual network, and it means different things to different people. Generally it is a combination of digital switching systems interconnected by digital transmission facilities and linked to customers [illegible] digital [illegible] This [illegible] digital [illegible] fies equipment [illegible] In a [illegible] grated services [illegible] zation of the telephone [illegible] proceeding according [illegible] set up a long time ago.

Will there be a role in the netw[illegible]

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[illegible] integration [illegible] can be [illegible] VLSI and [illegible] digital func- [illegible] digital logic gate [illegible] clock of all digital [illegible] 25 years [illegible] logic gate costs [illegible] sometimes [illegible] magni- [illegible] the field of [illegible] systems and [illegible] integrated [illegible]

What new services and systems might be made possible by VLSI?

In the realm of telecommunications there's a whole spectrum of things that have been conceptually possible for a long time but which low-cost modern technology is only beginning to make possible. For example, we live in a time when energy usage is critical and will become even more so in the future. Microelectronics and communications technologies together offer significant potential for energy management. Turning lights and other kinds of electrical equipment on and off in homes and places of business in an intelligent way is a simple task for microprocessors.

They can also monitor doors and windows to provide security for lives and property. Microprocessors easily connect to communications links to centralize surveillance and control. There's also the opportunity of associating telephone lines with television sets to call up and display text and data. These examples just skim the surface.

So I think the tremendous potential of VLSI is that it can put complex electronic systems at the disposal of people who couldn't previously afford them. This potential has caused what we call the microelectronics revolution, and it, in turn, has introduced us to the information age.

How have advances in computer-aided design fostered the development of VLSI?

The Situation.
Piecemeal approaches to on-line systems minimize potential productivity gains.

CINCOM USER INFORMATION SERIES 1

[illegible] systems, many users have adopted piece- [illegible] focused on one problem or need at a time. [illegible] needs by first buying a teleprocessing [illegible] with other packages for such vital [illegible] development, inquiry, etc. The [illegible] a non-integrated system that [illegible] is generally cumbersome

[illegible] data communications [illegible] This includes [illegible] support soft- [illegible] to perform [illegible] of the

COBOL code, which makes on-line programming easier than batch.

Series 80 ENV-DATA, the on-line data entry system that gives end users direct control of data entry.

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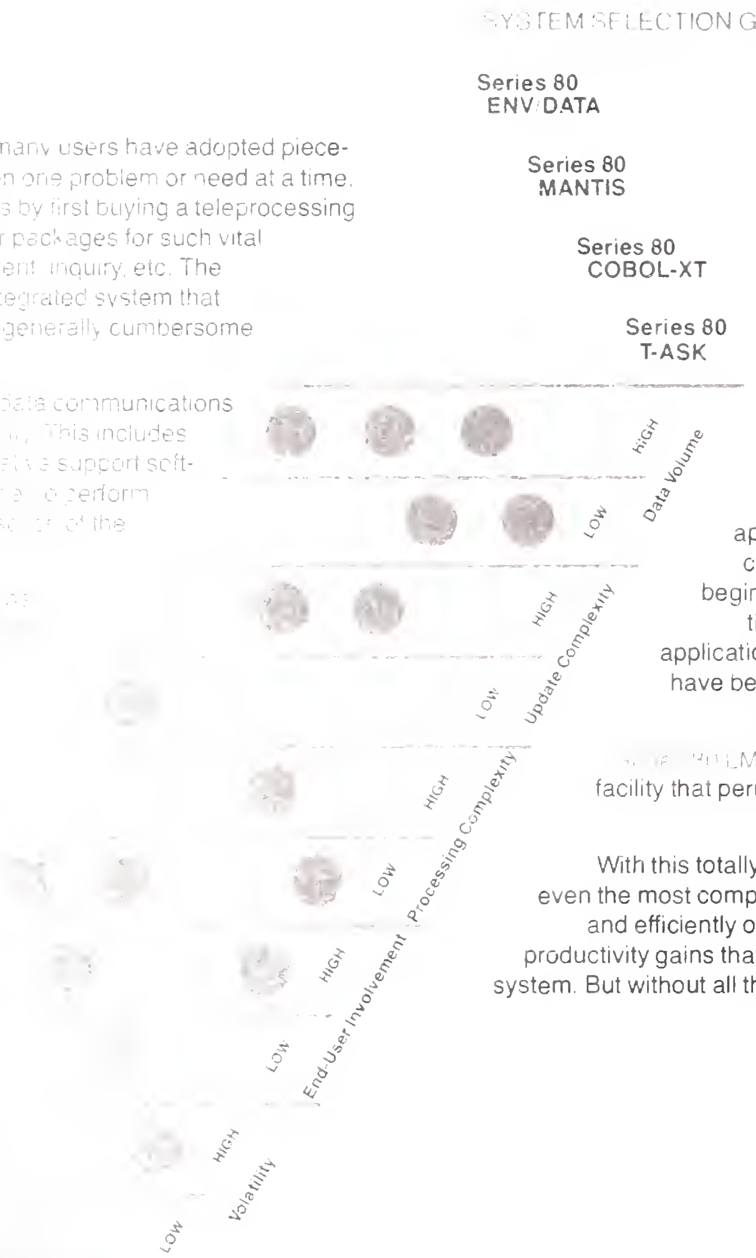


Well, perhaps [illegible] the other way. The [illegible] of VLSI has fostered the use of computers to aid in designing circuits. The reason for this is obvious. [illegible] chips, with hundreds of thousands of components per chip, are already being produced in large numbers, and [illegible] to up that component density to a half million and probably [illegible] more.

If you have a million [illegible] a chip, you'll need [illegible] interconnections [illegible] that "wiring" must [illegible] face of the chip and [illegible] less every connection [illegible] only way you [illegible] of complexity and [illegible] device will work [illegible] computers.

Don't get me [illegible] ple and not the [illegible] real heroes.

You said that hundreds [illegible] of components [illegible] for VLSI — then [illegible] What are we doing [illegible] step?

VLSI is [illegible] number of components [illegible] a chip has [illegible] since the [illegible] began around [illegible] few components [illegible] components [illegible] sands of components [illegible] fact, the [illegible] there isn't a [illegible] and VLSI.

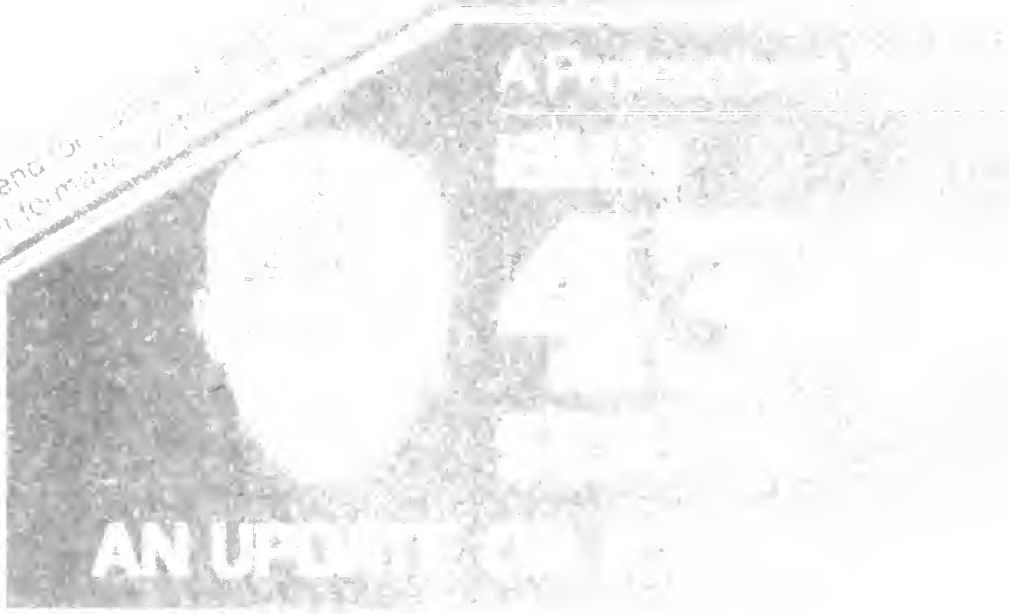
What [illegible] determined [illegible] going to start [illegible] components [illegible] technologies [illegible] and we've been [illegible] of these is [illegible] lets us produce [illegible] chip than are [illegible] technologies [illegible]

We are [illegible] the wavelength [illegible] trace a pattern [illegible] chip is too [illegible] small apertures [illegible] fabricate these [illegible] terns. X-rays [illegible] lengths, so by [illegible] pattern on the silicon [illegible] extend the limits of [illegible] niques.

We have also [illegible] beam techniques [illegible] lithographic masks [illegible] circuit patterns. These techniques [illegible] very fine beams of electrons [illegible] a pattern on the lithographic mask. In the future, this technique may be used to write patterns directly onto the surface of the silicon chip, avoiding the need for masks altogether. Using electron beams to write directly onto silicon, we may someday produce circuit densities 10 to 100 times greater, maybe more, than we are capable of producing today.

In the past, silicon processing largely depended on the use of liquid chemicals. Now, dry processes are allow-

[illegible] Automat[illegible] [illegible] But [illegible] [illegible]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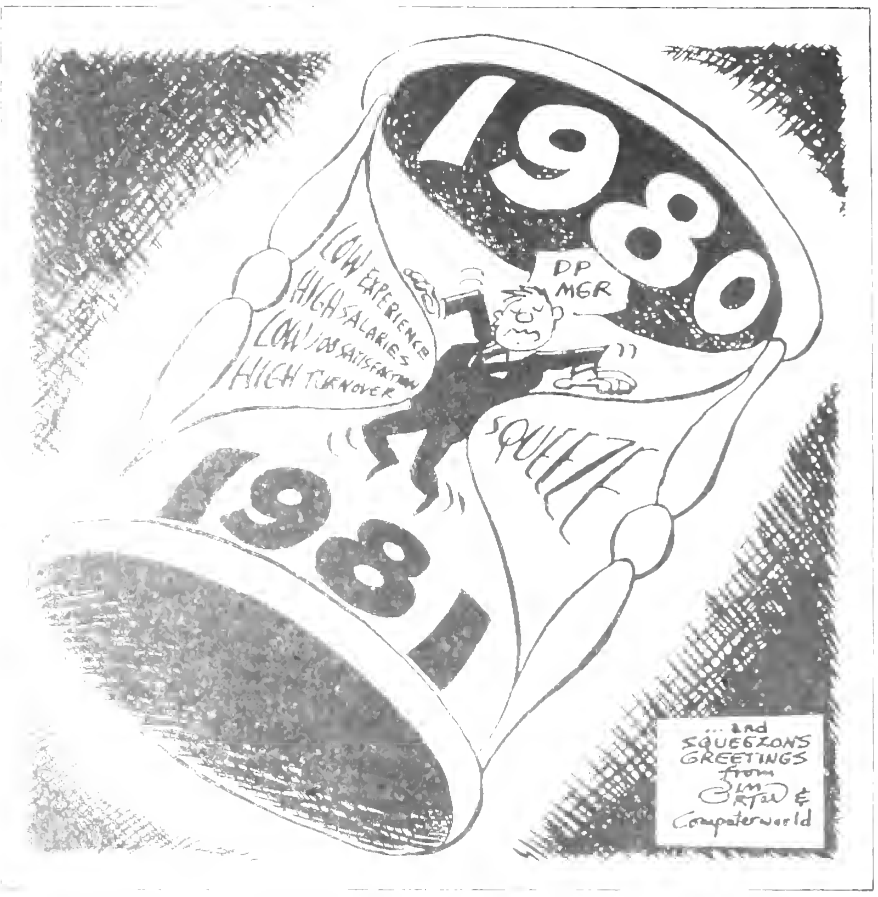

LETTERS

[illegible] Historically [illegible] development [illegible] the quality of [illegible] driven [illegible] establish and [illegible] maintenance [illegible] some of the [illegible]

[illegible]

[illegible] Sin

[illegible] By David [illegible] and I [illegible] contemplating [illegible] of our [illegible] pride [illegible] brag [illegible] in your [illegible] that [illegible]

talks, looks and feels like human and says and does only what you want [illegible] the oldest profession may be on its last legs — if you can't brag about it to someone?

I don't think human egos are strong enough — at least in humans living in what we call "highly civilized technical" [illegible] — to do without ego support from other humans. Computers can't do it. They're not and never will be built right for that.

Ray Russ
[illegible] Ohio

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DATA PAST

Five Years Ago
Dec. 31 1975/Jan. 5, 1976

SEATTLE — Several months after [illegible] facilities management [illegible] effectively knocked [illegible] out of the running, Seattle [illegible] King County's [illegible] DP facility for three [illegible] offer was almost too [illegible] and skeptical city officials [illegible] reluctant to accept it. [illegible] such thing as a free [illegible] Councilman Randy Revelle [illegible] quoted as saying in the local press. With the offer, Seattle hoped to lop $300,000 off its projected 1976 DP budget of about $5 million.

Ten Years Ago
Dec. 30, 1970/Jan. 6, 1971

TORONTO — A debtor's data bank was being assembled under the auspices of the provincial Department of Justice. Scheduled to be completed in three years, it would provide information to anyone for a $2 per search fee.

— — —

NASHVILLE, Tenn. — Several, perhaps hundreds, of Internal Revenue Service computer tapes containing thousands of tax records, erased by airport radar last spring, had yet to be restored. Inadequate grounding of metal shielding was cited as the cause of the wipeout.

READER COMMENTARY

Users Must Share Blame For Many 'Horror Stories'

Data process [illegible] with articles [illegible] motion by [illegible] against "uns[illegible] dors." Eve[illegible] the blame [illegible] vendors

Is that wh[illegible] tainly not! [illegible] biles that [illegible] they stay on [illegible] rips at the [illegible] strain. Thr[illegible] that, shod[illegible] looks grea[illegible] less in use

Somebody [illegible] trend in the [illegible] anyone th[illegible]

I can rem[illegible] a car into [illegible] car. I can [illegible] for a full [illegible] wards. W[illegible] have all ass[illegible] century [illegible] can popul[illegible] responsibil[illegible] supporting [illegible] vironment

We have [illegible] that you g[illegible] ever, great [illegible] chasers p[illegible] system, on[illegible] trade maga[illegible]

READER C[illegible]

[illegible]he Lowly [illegible]

When Eds[illegible] use of the [illegible] TO) in pro[illegible] troversy wh[illegible] has raged un[illegible] it should be [illegible] jkstra nor [illegible] tained that [illegible] GOTOs could [illegible] Dijkstra said [illegible] had observed [illegible] mers use relat[illegible] tively is the [illegible]

After this [illegible] programming [illegible] to bring order [illegible] tained that programs can be [illegible] without GOTOs. Some insist [illegible] "structured" program should [illegible] no GOTO statements. To date, how- ever, there is no consensus within our profession as to just what constitutes a structured program. Each practitioner has a different idea of what that means.

Most of us apply the term to the cre- ative process of programming as well as to its end result, the program and its documentation. Indeed, the word is a treacherous one, for anything that is not random is therefore structured. Every computer program is structured if one applies this last yardstick, no matter how poorly.

Nearly every statement in every pro- gramming language has implicit GO- TO. To where? To the next statement, in "lexical" order, that is, the next one

[illegible] mented with [illegible] GOTO [illegible] shows [illegible] control immediately to its caller. This works well from a documentation [illegible]

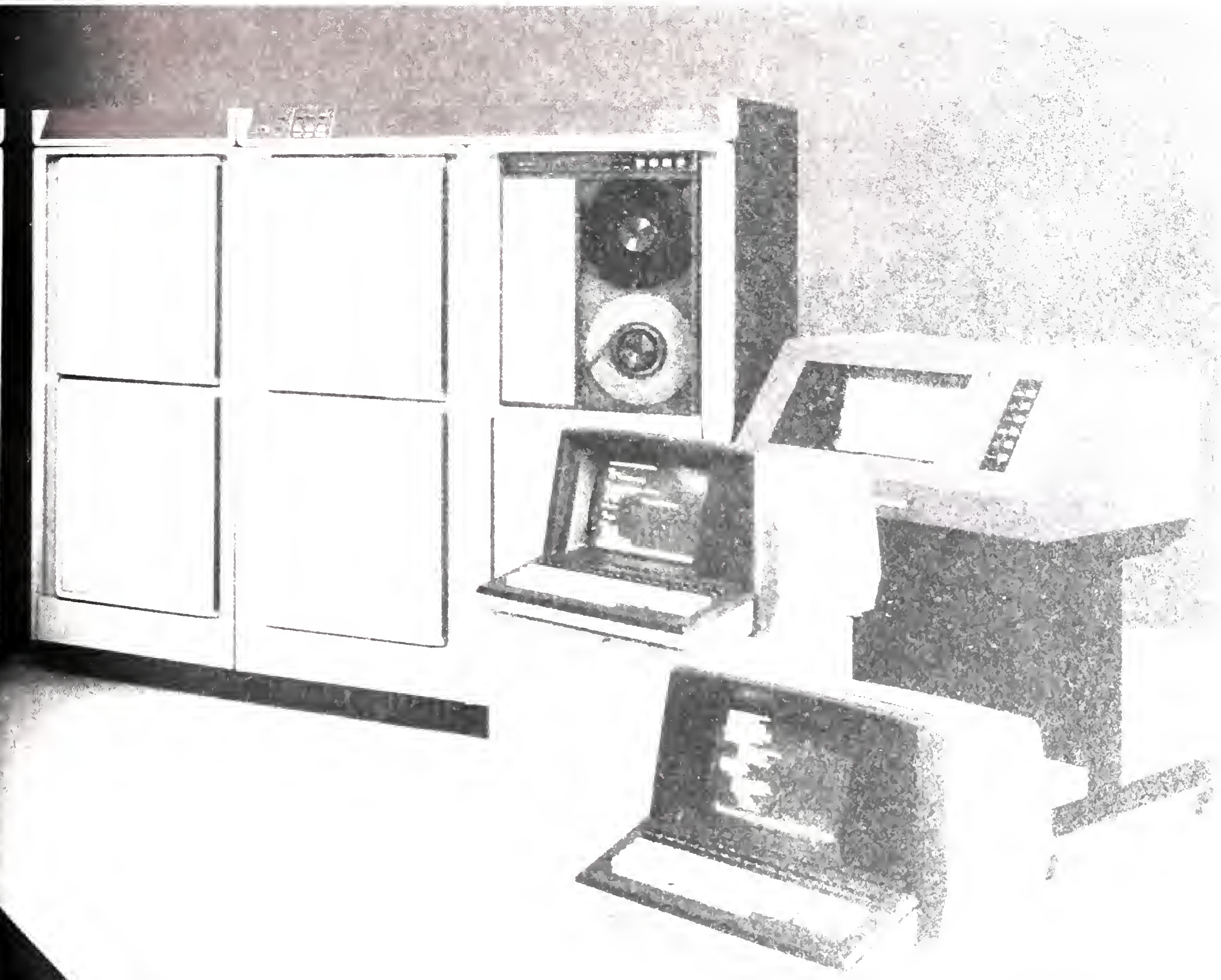
Meet the first family of compatible computers.

[illegible] you start with, you can easily [illegible] economically expand capac- [illegible] by upgrading your current sys- [illegible] adding another member of [illegible] the family.

Go big without going with the biggest. Sooner or later, [illegible] you'll need mainframe capabilities. You may even need them right now. If so, we have good [illegible] you won't have to buy from a mainframe company. Consider the Prime 750: It has full 32-bit architecture. Sixteen K-byte high-speed cache memory. Up to 8 million bytes of main memory. Thirty-two million bytes of virtual memory per user. And support for up to 2.4 billion bytes of on-line disk storage.

In brief, you can have mainframe capability for less than mainframe cost.

The virtues of compatibility. Thanks to our unique software design philosophy, all Prime com-



puters use the same operating system, the same file management, the same communications software which, incidentally, supports the IBM 3270 compatible Distributed Processing Terminal Executive and the X.25 packet switching protocol.

And all Prime computers run industry-standard COBOL, FORTRAN 66, FORTRAN 77, BASIC, RPG II, PL/1, and Pascal, as well as Prime's CODASYL-compliant DBMS and office automation software.

[illegible]

First and [illegible]

PRIME
Computer

[illegible] GOTOs Can Keep Programs' Structure

[illegible] and accordingly iden- [illegible] the module itself [illegible] characters are [illegible] is one being cho- [illegible] because para- [illegible] sequence [illegible] module are [illegible] list [illegible] listing's [illegible]

The fourth character is chosen from an installation standard list and used to describe the function of the module from a data processing point of view. For example M is mainline R is read X is exit and so forth.

Module Names

Finally, the module is named in English to complete the paragraph name. Our staff puts forth considerable effort in choosing the English portions of module names as well as the names of their internal paragraphs. We have found that the descriptive quality of these names is often crucial to the quality of the program and to the success of subsequent maintenance.

Briefly, the name should correctly describe the single function which is to be accomplished by the module, in a way not permitting misinterpretation. If such a name cannot be chosen, we conclude that the module, as conceived, lacks what Myers called functional strength and so we redesign until we achieve module(s) perceived as single-functional by the peer group.

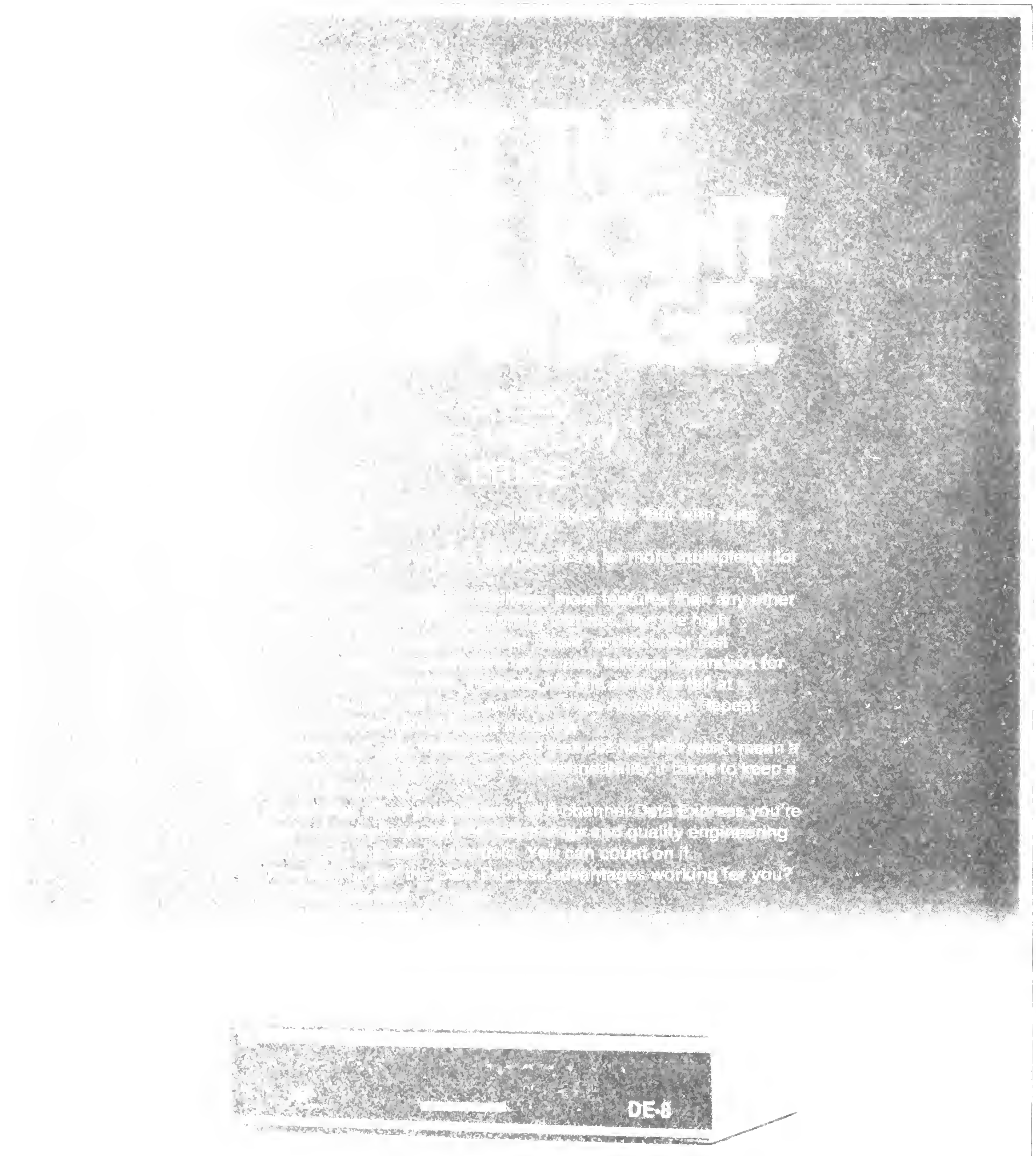
In this connection, we have noted a tendency on the part of the programmers to name a paragraph in honor of what has already been accomplished at the point at which execution begins, rather than for what the paragraph itself is to accomplish. This is a natural enough tendency, and it results from the sort of thinking that goes like this: "If we got to here, then it was because such-and-so is true . . . or was done." This thinking, even if correct in any particular instance, would be irrelevant. It would be like naming each book on the library shelf for the contents of the book just to the left of it and would lead to confusion.

Each logical module has two or more named paragraphs, the first of which is also the module-name. All except the last one of these contribute to the purpose of the module, while the last is the exit paragraph and contains only the exit statement. The method of naming an exit paragraph is to let 9X be the third and fourth characters of the name, followed by -EXIT. The choice of 9X allows the exit paragraph's name to be in alphanumeric order with the remainder of the module's paragraph names when it is placed at the end, lexically speaking.

Coding Standards: Whenever a module's purpose has been demonstrably accomplished while the next statement which would otherwise receive control is somewhere in mid-module, a GOTO exit paragraph statement is in-

HA HA
HO HEE
HA HO
HO HO
AWOWK80

'I Sure Hope That's Hex!'


[illegible] a lot more multiplexer for [illegible] more features than any other [illegible] high [illegible] fast [illegible] for [illegible] Repeat [illegible] mean a [illegible] it takes to keep a [illegible] channel Data Express you're [illegible] quality engineering [illegible] field. You can count on it. [illegible] the Data Express advantages working for you?

and Readability Intac[illegible]

serted. [illegible]

This exit-parag[illegible] combined with th[illegible] statements with [illegible] second procedure-n[illegible] ways to the exit-p[illegible] formed module [illegible] graph A11 [illegible] with this type of P[illegible] ment, and B3 sim[illegible] level modules [illegible]

The limits of ea[illegible] made obvious b[illegible] This is true whether [illegible] the code of the mo[illegible] code calling it [illegible]

Because the exit-p[illegible] sociated exit state[illegible] the end of a logic[illegible] ments and inde[illegible] (except at the ve[illegible] added, changed [illegible] module without [illegible] the module as [illegible] nal" point. This [illegible] the method, for [illegible] mer to concentra[illegible] code requiring [illegible] ment or change [illegible]

```
PROCEDURE
A10M-CRE
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A11M-
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     PERFO
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     IF
          
          G
     .
A12M-G
     .
A12M-
     .
A19X-
     ST

B10W-
     .
B19X-
B20S-
     .
B27R-
     .
B29X-EXIT.
B30I-GE
     .
     PERFO
          THR
     IF
          GO
     PERFORM
          THR
     IF   CO
          GO
     ELSE
          DISPLAY
B30I-IMPLEMENT-
     ACCEPT ERROR-
     IF   IGNORE-ERRORED-
          GO TO B30I-GET-
     ELSE
          IF   NOT CANCEL-
               DISPLAY 'WHAT
               GO TO B30I-GET-
          ELSE
               GOBACK.
B39X-EXIT.   EXIT.
     .
     .
     .
```

Sample Code

[illegible]ETTERS

[illegible] doubt that increas[illegible] [illegible] falsify [illegible] attack [illegible]

[illegible] is a growing [illegible] strong [illegible] papers.

Is there doubt that the technology exists to monitor our citizens? The West Berlin audiences I addressed early in October were convinced. They knew the danger.

I can appreciate that the ideas I put forward frighten Mirkovich — they frighten me. That is no excuse for ignoring the facts. Surely we are entitled to have a properly argued refutation, not just an attack on my integrity.

Robert D. Parslow
Uxbridge, Middlesex, UK

Choosing Software First

[illegible] competition is [illegible] price drop every few [illegible] including [illegible]

The chicken producer wanted to reap these benefits for its new system. From the company's point of view, transportable software gives a double economic benefit over the standard hardware-first approach, allowing the user to get better equipment later and at lower prices.

The user finally chose Microcobol, a system that currently works on some 30 systems, ranging from 16-bit systems like IBM's Series 1 to 8-bit gear based on various common chips. In one way, Microcobol seems to be even more transportable than most other transportable products — even the disks themselves can be moved between different systems, provided that the physical characteristics (8-in. size or whatever you use) remain constant.

The language is familiar to Cobol programmers, although the vendor, CAP-CPP, Inc., has dropped out the identification and environment divisions. Two groups of software support have been provided for application users and developers, respectively. The user runtime facilities include a multitask operating system (BOS) with standard utilities, optional linkage sections and interfacing capabilities, but without the development facilities of compiling, testing, libraries and debug utilities.

CAP-CPP and various OEMs also provide application programs which, because of the transportability of both language compiler and operating system, can be developed on one system and installed on dozens of others without modification.

With this software choice now made, the chicken producer's application is being developed, although most of the hardware has yet to be selected. Even its fundamental architecture is not firmly known, nor will it be uniform across the system.

In this case, "software first" has been a practical approach. The dollar costs are reasonable (single-copy retail price is $1,500 for the development system and the Multiuse Business Operating Runtime System is $750).

[illegible] D. Agapeyeff, CAP-CPP's chairman, admits that so far the ongoing development of micros and supermicros has not really impacted most DP departments, but he is confident that the effects cannot be long delayed. [illegible] of the software-first [illegible] well be the key point that [illegible] user.

[illegible] can be contacted through [illegible] CAP-CPP, Inc., 521 [illegible] N.Y. 10175 or [illegible] CAP-CPP, Inc., 200 [illegible] Palo Alto, Calif.

[illegible]

[illegible] brain..."

[illegible] using the DEC VT100 video terminal, you're [illegible] aware of the excellent attributes of that [illegible] also aware that a terminal's performance is confined to the system it operates under. No matter how impressive the terminal, when jobs stack up, turnaround time goes down, and you wait. While [illegible], that impressive terminal might just as well [illegible].

[illegible] is proud to offer the VT100 Conversion Kit. This kit allows you to convert your terminal into a commercial grade microcomputer with the simple installation of a [illegible] microcomputer board.

[illegible] the possibilities:

[illegible] VT100 Conversion Kit includes a 64 kilobyte [illegible] microcomputer board with 32K bytes of [illegible], a detailed installation manual, [illegible] (a superset of Microsoft Basic [illegible] allowing for very flexible [illegible] either CP/M or MP/M licenses depending on the user's choice. An optional diskette/printer [illegible] board is also available.

From a basic terminal, to a commercial grade microcomputer with built in networking capabilities, the VT100 Conversion Kit from Data [illegible] can do it.

Tap your heels together three times and give us a call.

[illegible] node

[illegible] here to help.

[illegible] 95008 • (408) 744-0561

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- There is
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- Employees
and oral statements regarding the
sults of the appraisal

• TEST DRIVE
on kit with a 30-day
FOR DETAILS on the data node add-on kit, our special introductory
clip it to your letterhead, and mail to:
Marketing Manager, Service
Data Node, Inc.

[illegible] Must Share Blame for 'Horror Stories'

[illegible] the federal [illegible] our free- [illegible] those [illegible] today enter- [illegible] companies come [illegible] so-called [illegible] various [illegible] judging from [illegible] they [illegible] business- [illegible] be protected [illegible]

[illegible] Mistake

[illegible] businesspeople [illegible] buying [illegible] from [illegible] [illegible] ing in for an operation. If you're buying a computer for your business you don't need to be in DP. There are people trained for these jobs. Colleges are offering degrees in computer-related fields. There is nothing simple about a totally interactive order processing and general accounting system. You don't have to learn all about computers to get one to work for you any more than you have to study internal-combustion engines to drive to work.

A computer system should be installed in your office preprogrammed and ready to perform the specific jobs you had in mind at the time you purchased it. The books may be interesting, but they can't make you an expert. Businesspeople who find themselves getting involved in the detailed algorithms of computer programs often find themselves neglecting their own businesses.

A very successful businessman once told me, after he had purchased a Texas Instruments Inc. computer, that his son (who had no previous programming experience) was going to take a three-day course and return to write all the necessary programs he needed to run his real estate company. Another businessman recently told me that he had a CPA friend who, given a couple of days, could write a computer program to make a computer do anything he wanted it to do.

These things are simply not possible. There is no cheap way of getting a computer system to perform more than simple tasks. A business computer installation will become a major investment. It should be planned for, thought about and planned for again.

It takes years to become a proficient computer programmer, yet businesspeople all over the country are entrusting their systems to would-be programmers with nothing more than a few hours of self-taught "game" programming behind them. This is really absurd. At the present time good computer programs may cost $100 or more per line of error-free code to develop. This means that a small company might spend from $40,000 to $80,000 to develop a totally integrated financial accounting system.

If you are considering a computer installation, you have become a prime target for a fast-talking, low-balling computer salesman. You'll need facts, proof, demonstrations at businesses already using a comparable system and, most of all, expert assistance.

Here are a few basic rules to prevent a costly mistake. You must adhere to them rigidly.

- Put everything down on paper!
  - a. What do you want the computer to do? Exactly!
  - b. How much can you afford to spend?
  - c. When do you want it installed and working?
- Go find an expert! And I don't mean a relative who sells calculators or has taken a programming course in college. Hire a reputable computer consulting firm to go over your notes and pay it to do an in-depth study of exactly what type of software is required to make a system work for you.
- Buy the computer system on which the software was designed to operate! The greatest software package in the world could be worthless to you unless you have the computer system for which it was designed. Ask the expert to determine that the system is expandable to meet your future requirements.

Further, I'm sure that there are hundreds of professional businesspeople who have purchased inadequate software, hardware or both and have invested so much money in their present system that they feel compelled to continue to throw good money after bad in an attempt to salvage something from a very embarrassing mistake. Well, pride is not the better part of survival. If you are one of these people, stop and go find an expert.

Scott is director of marketing for Applied Information Management Sciences, Inc. in Monroe, La.

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What About the DP Manager? — Part 2

Data Dictionaries Bring DBMS [illegible]

By Ron Ross

Special to CW

Despite current shortcomings data dictionary packages are perhaps the most significant tool evolved to date to help the DP manager bring control over system development. The only drawback — and it proves to be a major one — is that almost all data dictionaries fail to support the preimplementation phases of the data base system project. If the data dictionary concept could be reoriented to address these phases, a powerful tool for controlling data base development projects would be offered to the DP manager.

What, When, How

Some reflection on the data dictionary approach shows [illegible]

[illegible]

The DP manager [illegible] control and coordination [illegible] installing a DBMS [illegible] of the possible [illegible]

[illegible]

Tektronix Adds to 'Plot 50' Line

BEAVERTON, [illegible] — Tektronix, Inc. here added [illegible] products to its Plot 50 [illegible] 4050 series [illegible]. The software library [illegible] graphing, drawing [illegible] preparation, statistics [illegible] management and [illegible] programs that range [illegible] $800 to $4,000.

The picture composition software was designed [illegible] non-computer users [illegible] development of engineering [illegible] drawings. Tektronix [illegible] reportedly allows the [illegible] interact with graphics [illegible] that objects can [illegible] moved anywhere [illegible] and deleted [illegible] other display com[illegible].

Essentially an [illegible] pad, it allows [illegible] "edited" drawing [illegible] because the user [illegible] from "graphics [illegible]" include lines, arcs [illegible] circles, the vendor [illegible].

Supporting [illegible] with dynamic [illegible]

CICS, 'Shadow II' Users [illegible]

[illegible]

'Dataquery [illegible]

[illegible]

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SHARED TAPE
ALLOCATION
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for shared device installations

SDSI [illegible] RESERVE [illegible]

STAM [illegible]

[illegible] Dictionaries Ease DBMS Development

[illegible] Definition of these [illegible] should capture both the [illegible] structure of the [illegible] — and the delivery [illegible] that view. These in[illegible] volume currency [illegible] sequencing [illegible] requirements.

[illegible] requirements must be [illegible] that users can [illegible] understand them. While [illegible] base [illegible] they [illegible] data base management [illegible] DBMS bias.

[illegible] detailed requirements must be [illegible] the design [illegible] to provide vital continuity [illegible] success.

[illegible] blueprint for the [illegible] system — logical data base architecture. Developing a logical architecture allows the design dictionary user to express the grouping of data elements into record types, record types into logical files and required keys and sequences in DBMS-free fashion. The data resource is defined optimally to ensure its evolutionary capacity and ability to satisfy end-user requirements.

The Changing Picture

Recent attention has been focused on tactical tools devoted to specialized tasks in the data base architecture area. Relational data analyzers are one example.

Real assistance for the DP manager will arrive only when such tools are integrated within a master data base design dictionary system.

While some data base system design methodologies recommend the design dictionary concept, this dictionary is usually generated manually. Attempts to mesh it with the corporation's standard data dictionary usually meet with marginal success and the control aspect is not emphasized.

However, the picture is changing rapidly for several reasons. First, as data base system experience increases, the lack of a developmental control tool is becoming more apparent.

Second, data dictionary vendors are coming to a realization that a radical new approach is needed.

Finally, the advocates of various data base design methodologies are learning that implementation of a formalized discipline of collecting and maintaining specifications is necessary for the effective operation of the methodologies.

Ross is the editor of Performance Development Corp.'s Data Base Newsletter. *He has recently written a book on data administration and data dictionary systems that is scheduled for release by Amacom, the publishing arm of the American Management Association.*

Tektronix Adds To 'Plot 50'

(Continued from Page 89)

ed documents, an automatic table of contents, automatic page numbering and text insertion, he said.

Available for the 4052 and 4054 computers, this package costs $800.

Presentation Aids

A presentation aids package that creates bar charts, line graphs, pie charts and text on overhead transparencies was introduced for $850. The software produces quality text with a software font, widths and thicknesses so that charts and graphs can be combined with text on a single overhead slide, the vendor said.

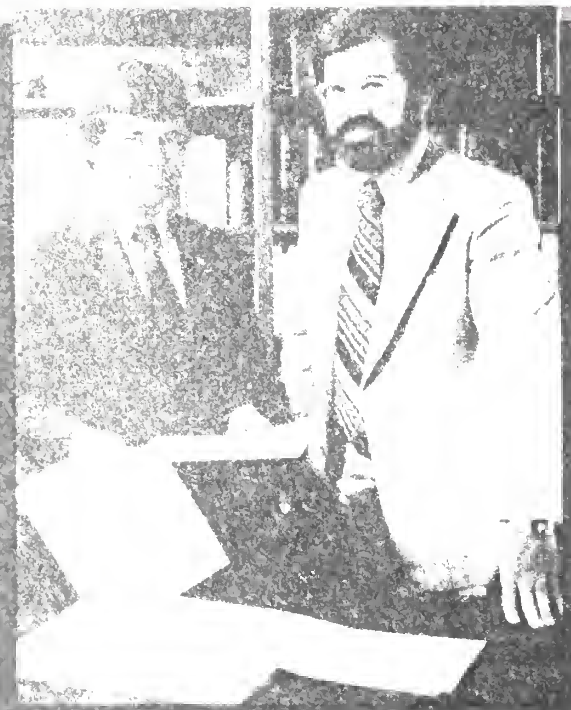
An interactive modeling package utilizes the 4050 graphics capabilities to create graphs, charts and diagrams that depict various project models, according to a company representative.

Designed to effectively schedule and track projects and to evaluate the interdependencies of tasks within a project, the project management software costs $4,000.

Two statistics software packages introduced at the same time offer analysis of variance and statistics and multiple linear regression at $800 each, the spokesman said. The second and third products in the Plot 50 statistics software family, they are disk-based programs that utilize a standard file format to allow different programs in the series to share data, he added.

The last product in the announcement was an interactive digitizing package designed to simplify graphics data base creation.

A menu-driven program that supports the 4052 and 4054 computers, it utilizes the 4956 graphics tablet for input and the Model 4907 file manager as a flexible disk storage device, according to Tektronix, which can be contacted through P.O. Box 500, Beaverton, Ore. 97007.



Buddy Pollard, Tom Clausen

Allied Bancshares Accounts for the Future with IFPS®.

[illegible] Buddy Pollard, Allied's Assi[illegible] [illegible] "We selected [illegible] IFPS has [illegible]

[illegible] money market certificates, and changes in reserve requirements are examples. There's also the apparent ongoing volatility of money market rates. We feel the situation demands an interactive, automated approach to the planning function. IFPS has fully met our planning needs and will continue to assist us in creating opportunities in a rapidly-changing environment."

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[illegible] 758, Austin, [illegible] 78766 (512) 345-6560 (attention: Kathy James) [illegible] (312) [illegible] (415) 493-2633, Houston (713) [illegible] (2[illegible]) 887-0333, Austin, TX (512) 345-6560, New England [illegible] contact EXECUCOM — Austin for names and addresses of in-

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Now [illegible] Datapoint [illegible] users [illegible] tions [illegible] Associative [illegible] nificant advan[illegible]

AIM [illegible] trieves [illegible] enter. You [illegible] ture to [illegible] those [illegible]

AIM lets [illegible] even with [illegible] keys. Multiple [illegible] single index [illegible] out the need for [illegible]

Now you can search [illegible] membered field or element of description text. Search personnel files by any combination of first, middle and last names. If you can't find it with AIM, it isn't there.

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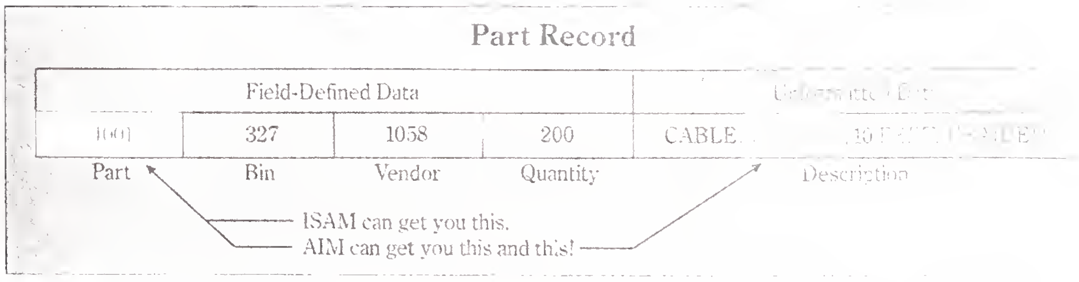
Grow and E[illegible] [illegible] gramming. [illegible] architecture [illegible] power [illegible] your database [illegible] When your [illegible] Datapoint [illegible]

Low-Cost Lease [illegible]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CABLE
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Bin
Vendor
Quantity
Description
ISAM can get you this.
AIM can get you this and this!

... Know the State, ... Color of Eyes

Cobol Source Code Generator

'C/Script' Out for DG's AOS

AUBURN, Ala. — A Cobol source code generator formerly available only on Data General Corp.'s Icos operating system is now available for its Advanced Operating System (AOS) from Commercial Systems Corp.

The System Development System C/Script is said to reduce program development time by as much as 95% and program debugging time by as much as 100%.

C/Script takes user responses to questions and generates Cobol source programs to handle the functions of data entry, file maintenance, reports and inquiries, according to the vendor.

OEM and end-user licenses cost $7,500 and $4,500, respectively. Commercial Systems Corp. will reimburse travel expenses of up to $1,000 for prospects reviewing C/Script if they subsequently purchase a license. The firm can be reached through P.O. Box 2338, Auburn, Ala. 36830.

HP Software Available For 9800s

PALO ALTO, Calif. — Hewlett-Packard Co. is offering Linear Systems Analysis software for its Series 9800 System 35 and System 45 desktop computers.

The software includes modules for entering the system design into the computer, producing analysis plots of the system performance.

It will be useful to electrical, mechanical and chemical control engineers, the vendor claimed.

The product is available for a one-time license fee of $500, the vendor said, from 1501 Page Mill Road, Palo Alto, Calif. 94304.

Interface Links 'Datamanager,' 'The Librarian'

LEXINGTON, Mass. — Users of MSP Inc.'s Datamanager data dictionary can obtain through Datamanager's Swap-Shop an interface program to The Librarian, Applied Data Research, Inc.'s program library management system.

Written by Magazine Zum Globus, Switzerland's third largest department store, the interface program was designed to synchronize the contents of the source program library and the data dictionary without the need for clerical updating.

Currently available for users of IBM's OS operating system, the interface program carries a handling charge of $25 through the Swap-Shop. MSP is located at 21 Worthen Road, Lexington, Mass. 02173.

'Estimator' Aids User Projections

PHILADELPHIA — Atlantic Software, Inc. has announced the automation of the estimating standards and process of its SDM 70 Systems Development Methodology.

Estimator, which can be provided with SDM 70 or as a stand-alone system, is said to help users estimate project time and cost for each phase of the systems life cycle.

Base price for the Estimator is $15,000 from 320 Walnut St., Philadelphia, Pa. 19106.

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For Series 1100

Univac Combines Screen Gener[illegible]

BLUE BELL, Pa. — A [illegible] Processing System [illegible] the Sperry Univac Series 11[illegible] mainframes assists users in [illegible] the development and [illegible] tion of application programs by combining an [illegible] screen generator and [illegible] handler.

The DPS 1100 [illegible] programmer produ[illegible] eliminating the [illegible] overhead typi[illegible] with applicatio[illegible] and access [illegible] displays, Uni[illegible]

All input and [illegible] format design [illegible]

Newslett[illegible] Offers T[illegible] On Testi[illegible]

SAN FR[illegible] ware Resea[illegible] is offering [illegible] to its quar[illegible] Testing [illegible]

The news[illegible] the techni[illegible] quality as[illegible] methods [illegible] the effecti[illegible] of comp[illegible] kinds a sp[illegible]

Recent [illegible] letter has [illegible] tions of [illegible] Cobol progr[illegible] of structu[illegible] sures for [illegible] vestigation[illegible] hierarchica[illegible] programs [illegible] strumentatio[illegible] programs.

Testin[illegible] availabl[illegible] anyone w[illegible] scription [illegible] head.

'Datasca[illegible] Gets WP, Graphics

WHITE PL[illegible] — Vista Compute[illegible] veiled graphics and [illegible] cessing (WP) [illegible] data base man[illegible] porting system [illegible]

The graphics [illegible] users to depict [illegible] or connected-line [illegible] formation that was previously presented only in [illegible] the vendor claimed.

The WP option com[illegible] capabilities of [illegible] with enhancements [illegible] clude editing functions [illegible] ciated with wor[illegible] including 132 [illegible]

The options [illegible] $5,000 each.

Vista Computer is located at 709 Westchester Ave., White Plains, N.Y. 10601.

BRA[illegible]

- [illegible]
- SWITCHABLE [illegible] switch betwee[illegible] mix locals and remotes[illegible] IBM addresses on the same [illegible] Braegen B6 CRT can replace [illegible]
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• VSAM Considerations within CICS • Optimizing VSAM
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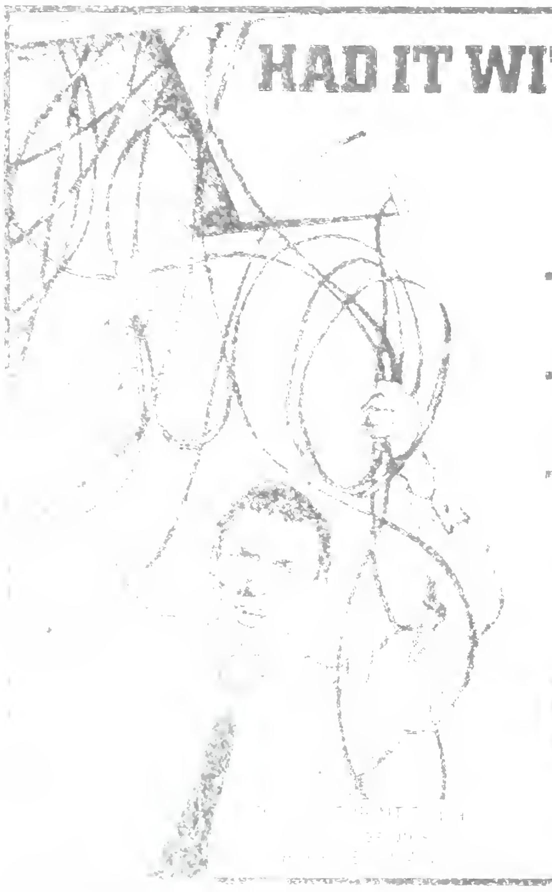

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'Super/Doc' Aids Users In Cobol Documentation

VAN NUYS, Calif. – A Cobol program documentation system designed to provide management, programmers and analysts with standardized tools for program and system documentation is available from Occidental Computer Systems, Inc. It runs on IBM and other Cobol systems.

Super/Doc is a complete set of program documentation outputs that may be selectively generated from a Cobol source program. It allows the user to utilize any or all of the 10 possible outputs for program documentation or as programmer aids in maintenance and debugging activities, the vendor claimed.

The system costs $1,200 from Occidental at 6666 Valjean Ave., Van Nuys, Calif. 91406.

'JSS' Release for IBM 5280 Includes Utility Package

JEFFERSON CITY, Mo. – Software Systems, Inc. has announced Release 2 of its Job Stream Supervisor (JSS) for the IBM 5280 distributed data system. This release includes a utility package consisting of FILE BUILD, DELETE, COPY and RENAME.

The JSS is an operating system that gives the 5280 the ability to execute job streams and procedures from menus using a System/34-like job control language, "effectively turning the 5280 into IBM's lowest priced small business computer system," Software Systems claimed.

JSS Version 2 is available immediately for a license fee of $500.

Software Systems can be reached through Box 1766, Jefferson City, Mo. 65102.

Series/1 WP Package Bows

SAN JOSE, Calif. – Systar Corp. has announced a new version of WP/1, the firm's word processing (WP) package for the IBM Series/1.

The new version is said to give users increased capability to create documents using stored information. "Boiler plate" letters from a mailing list or customized contracts from a series of stored paragraphs reportedly can be created.

WP/1 operates under EDX and can be run simultaneously by multiple users or in conjunction with other EDX-based application programs. WP/1 is provided on diskette with a self-teaching user's guide. A one-time license fee costs $2,500 from the firm at Suite 208, 1762 Technology Drive, San Jose, Calif. 95110.

Bentley College Continuing Ed To Offer Three-Day DBMS Meet

WALTHAM, Mass. – Bentley College Center for Continuing Education will offer a three-day seminar on data base management systems (DBMS) here Jan. 12-14.

Fundamentals of the data base concept, organizing information for storage and retrieval, the data base design process, new data base environments and organizing the data base administration function will be discussed. Participants will also learn the selection of the right data base system at the right price and with adequate back-up services and support from vendors.

Harvey M. Weiss will conduct the seminar. Registration costs $560 for the seminar.

More information is available from Bentley College's Center for Continuing Education, Beaver and Forest Sts., Waltham, Mass. 02254.

Rosa Elected Mims President

TUSTIN, Calif. – Joseph J. Rosa, director of management information services at Management Assistance, Inc.'s Basic Four Information Systems Division, has been named president of a newly formed group of users of Mitrol Industrial Management System (Mims) software.

Mims, a data base management system and high-level language, is used by many large companies for management information processing and reporting.

It was first developed by the Mitrol Corp. in Burlington, Mass., and is now owned by the General Electric Information Services Co.

The next group meeting will be held in the Netherlands in June.

Further details are available from Joseph Rosa at MAI's Basic Four Divisions, 14101 Myford Road, Tustin, Calif. 92680.

Audit Tool Directory Offered

CHICAGO RIDGE, Ill. – A directory that enables readers to identify and locate audit software tools that are available to perform specific audit tasks is available from EDP Audit Associates, Inc.

"Audit Utility Tools Directory" explains what 24 tools do, the systems within which they operate, their languages, advantages, suggested uses, minimum hardware, required training and cost.

The preliminary volume costs $25, including all first-year updates. Subsequent periodical updates will carry a nominal fee. The firm can be reached through P.O. Box 255, Chicago Ridge, Ill. 60415.

System/34 Gets Documentation

NEWTON UPPER FALLS, Mass. — A software documentation package for the IBM System/34 that is said to automatically provide management-level documentation without adding to a programmer's work load is being offered by Mann Data Inc. [illegible]

The package, made up of 12 reports, generates documentation that meets commercial standards [illegible]

Employment Job Browse Facility Designed for 8100s Under DPCX

WHITE PLAINS [illegible] announced an Em[illegible] Job Browse Faci[illegible] running the DPC[illegible]

The package [illegible] bureaus of emp[illegible] fer an automat[illegible] mation system [illegible] nals equipped [illegible]

The package [illegible] available jobs [illegible] graphic loca[illegible]

Most emplo[illegible] currently us[illegible] list jobs. The [illegible] more easily updat[illegible]

The package [illegible]

Software Bows For Dentists, Consultants

MISSION VIEJO [illegible] soco has announ[illegible] for dentists, atto[illegible] The packages [illegible] form appointme[illegible] sional time mana[illegible] billing and ma[illegible]

The dental pa[illegible] features pre[illegible] Dental Associa[illegible] third-party pa[illegible] location and pr[illegible] patients who a[illegible]

Professional [illegible] neys and [illegible] cial reports [illegible] and special ac[illegible] lyze court time [illegible] tainer or contin[illegible]

Professional [illegible] consultants, acc[illegible] administrators [illegible] of subjobs, spec[illegible] head accounts, bu[illegible] materials, contracts [illegible] cost accounting and other functions, the vendor claimed.

Each package costs $750, the vendor said from 26251 Via Roble, P.O. Box 2325, Mission Viejo, Calif. 92690.

Candle Monitor, Analyzer Back CICS

MARINA DEL REY, Calif. — Candle Corp. has announced that its Omegamon CICS real-time monitor and RTA CICS response time analyzer now support Version 1, Release 5 of CICS in addition to CICS 1.3, 1.4 and 1.4.1.

Omegamon CICS costs $15,000, and the optional RTA CICS costs $5,000.

Candle is at Suite 624, 4676 Admiralty Way, Marina del Rey, Calif. 90291.

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INDUSTRY

At one of 20 sites around Genrad's Acoustics, Vibration and Analysis Division, Tom Freeland pauses to speak with one user of the division's manufacturing information system.

Manufacturing Software Smooths Genrad Inventory

SANTA CLARA, Calif. — Beset by inventory control problems, Genrad, Inc. installed an interactive, on-line manufacturing software system to expedite the firm's business transactions. Extended lead times, constantly changing prices and the burden of coordinating remote assembly locations were some of the major problems leading to the purchase of NCA Corp.'s MS-11 package for Genrad's AVA Division.

Genrad was shipping less than [illegible] in orders a month using a [illegible] inventory system when Tom [illegible] manufacturing manager [illegible] came to the company [illegible].

[illegible] the division's new Digital Equipment Corp. PDP-11/35 [illegible] month [illegible] 5,000 packages [illegible] MIS groups [illegible] Twenty [illegible] strategic [illegible] information [illegible].

[illegible] MS-11 system and [illegible] building [illegible] could [illegible] necessary [illegible] could be [illegible].

[illegible] product [illegible].

[illegible] departments [illegible] buy [illegible] MS-11 as a common [illegible] system linked [illegible].

[illegible] information [illegible] We immediately [illegible] we have [illegible]. This inventory is [illegible] at all times.

[illegible] management-by-exception policy, Freeland can be confident costs are in control. If either quantity or cost of input exceeds the bounds that management has established, the comprehensive nature of MS-11 directs attention to the difference. Freeland and his staff can then focus their efforts where they will do the most good.

Inventory Cuts

Stressing that aggregate inventory totals represent only the tip of the iceberg, Freeland believes the real value of Genrad's integrated MS-11 system is in its ability to take cuts across inventories. He illustrates this point by discussing the total inventory and accepted industry ratios.

"Our total inventory — including receiving, stockroom, work-in-process and finished goods — follows the industry rule of not letting inventory exceed 20 [illegible].

"We're running right on target. Because we can take this cut across the inventory by product line, we can immediately determine inactive and obsolete inventories. The MS-11 system allows us to see how often the deviation [illegible] and where it is, so we can do something about it. In our ever-changing marketplace, that's management-by-exception at its best."

The MS-11 provides a simple and effective approach to monitoring vendor performance.

"Suppliers who are consistently early in their deliveries may create a serious impact on inventory carrying costs, [illegible] cash flow, warehousing and [illegible]. In such cases Genrad can immediately deny delivery or payment in accordance with the schedule maintained in the MS-11."

His advance knowledge of those suppliers who have slipped their delivery [illegible] in running [illegible] factory. At any time Freeland can instantly ascertain Genrad's total commitment to vendors, what they are, when their products are due and other vital performance measurements.

International Software Meet Set for San Diego in March

SAN DIEGO — The Fifth International Conference on Software Engineering to be held here March 9-12 will feature demonstrations by commercial, academic and government software tool builders.

The goal of the conference is to increase knowledge of what software tools can do and how they can be used productively in software engineering.

The conference will include tutorial and seminar sessions. The charge for each tutorial ranges from $65 to $100 depending on when attendants register and whether or not they are members of the Association for Computing Machinery (ACM) or the Institute of Electrical and Electronic Engineers (IEEE).

More information is available from Ray Houghton, National Bureau of Standards, Room A265, Technology Building, Washington, D.C. 20234.

Theta's 'PDS' Offered Users Of DEC RT-11

GLENDALE, Calif. — Theta Business Systems is offering a Pascal Development System (PDS) for users running under Digital Equipment Corp.'s RT-11 operating system.

PDS can run in single-job or multiuser modes under TSX. It also runs within the standard 56K-byte RT-11 operating system, the vendor said.

Theta includes PDS with [illegible] ing packages, however [illegible] $1,000, the vendor said [illegible] 106, 1110 Sonora [illegible] lif. 91201.

Accounts System [illegible] Runs on PDP-11 [illegible]

ST. PAUL [illegible] Digital [illegible] PDP-11 [illegible] RSX-11 [illegible] $2,500 [illegible]

HP Desktops OK for Mc[illegible]

ST. LOUIS, Mo. [illegible] Hewlett-Packard [illegible] computer have been [illegible] mote terminals [illegible] network of McDonnell [illegible] mation Co. (McAuto) [illegible]

The qualified [illegible] 45B, 45S and [illegible] 45T communica[illegible] puter at line speed [illegible] System 45S [illegible] up to 300 bit/sec [illegible]

HP's terminal [illegible] the 9845 compu[illegible] slightly to [illegible] Auto's time [illegible] Auto supplies [illegible] these changes.

McDonnell Douglas [illegible] in St. Louis, Mo. [illegible]

'Denta-Count' Rx For Dental Clinics

SPRINGFIELD, Mo. [illegible] grated financial management [illegible] for single-doctor offices or multiple-dentist clinics is available from Data Center, Inc. It is named Denta-Count.

Designed for use with the AM Jacquard Systems, Inc. line of minicomputers, the package includes accounts receivable with systematic aging, billing, patient records control, relative value system, insurance claim handling and predetermination setup.

The basic system costs $19,000, the vendor said from 1950 V S. Glenstone, Springfield, Mo. 65804.

APL Video Course Out

TORONTO — A training course on APL is available on video tapes from Numetrix Limited.

The 20-hour course includes student manual with workbook and [illegible] video tapes. The course assumes no prior knowledge of computers or APL.

The course carries a one-time license fee of $5,000 from [illegible] Suite 600, 3 Church St., Toronto, Ont., Canada M5E 1M2.

TELEX SERIES 80:
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Congratulations. You've upgraded to — or at least ordered — IBM 4300 Series processors to gain major price/performance improvements and environmental enhancements. Now, what about your tape drives?

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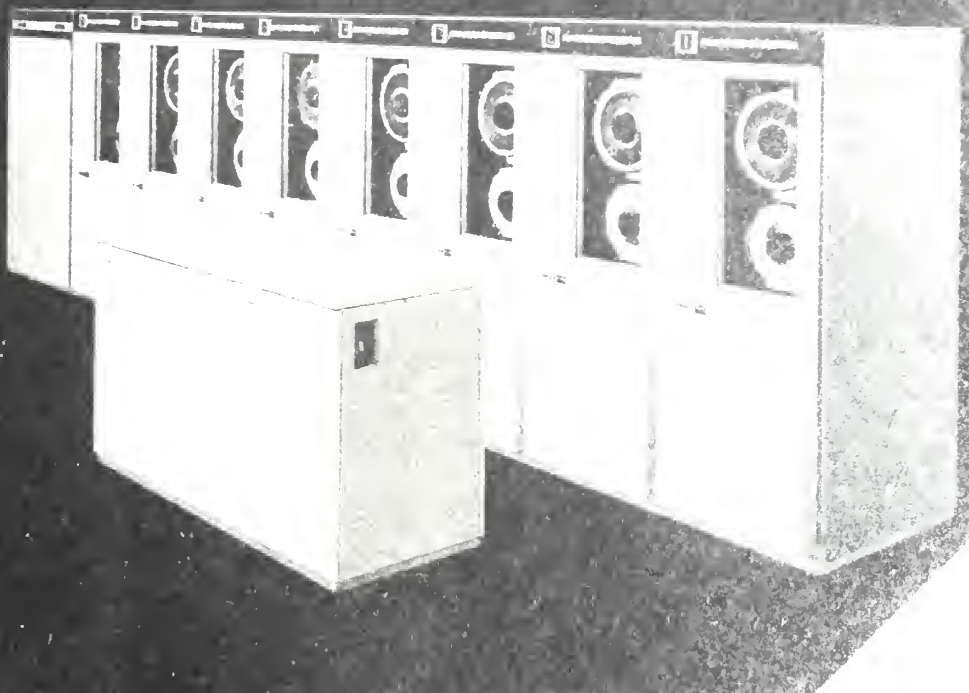
Series 80 drives offer 6250 bpi (GCR), 1600 bpi (PE) and 800 bpi (NRZI) data formatting — at transport speeds up to 125 ips; all with capabilities beyond those normally required on 4300's and at a price well below IBM's comparable offerings.

Series 80 is smaller and lighter than the IBM 3420 and its equivalents. Five Telex drives fit comfortably in the space normally required by four IBM drives. Series 80 also generates 30% less heat and consumes 35% less power. Patented Telex features like the Supr-Lite™ Capstan and Telex Tape Path ensure smooth, reliable back-up storage.

For more information on the tape drives made to complement your 4300 processor and other IBM systems, contact your nearest Telex representative. Or call Series 80 Marketing toll-free (800) 331-2623.



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[illegible] Toxic Substances

[illegible] DBMS Keeps Information Flowing

[illegible]

demands for product information in the future. We could see the need for a central repository of product data for supplying information on the physical and chemical properties of materials, toxicology information, health studies and other data as required for regulatory compliance. We knew our current manual methods of recordkeeping and reporting were just not cost-effective.

Establishing Objectives

[illegible] objectives for a new Product Profile Information System were established: the system must be cost-effective, usable by non-data processing people, modular to facilitate growth and integration, have an expected life of 10 years, be secure and use existing software and hardware when feasible to take advantage of the experience base.

We looked at the objectives for the system and measured them against available software packages, including those that could be developed. When we began looking for keyword text processing capabilities, we checked to determine if any of the several proprietary software packages already in-house could do the work, including the Inquire data base management system (DBMS) from Infodata Systems, Inc.

When we considered the user-friendliness factor, Inquire was our best candidate. Inquire had been in use at Shell since 1970 for other systems including several HS&E applications.

The core data module for the Product Profile Information System is a nonbibliographic data base that permits the recording of information contained in Shell's Material Safety Data Sheets. The system also handles the printing and distribution of these sheets to customers and employees for use in handling the materials.

Inquire handles all the data as well as mailing information, but more important than routine mailings, the system will automatically print revisions for all persons who received the original safety sheets. To help speed data collection, an IBM OS/6 word processing system is used and a Cobol program is used to interface between the word processing system and the DBMS.

Future plans include adding to the Product Profile Information System other modules containing information on Shell's products, including the Toxin and Chemfile data bases, which allow multi-data base retrieval. The modular design of the systems will permit adding additional information modules, additions anticipated to continue over the next five or six years.

Development Background

The Toxin and Chemfile data bases are two of many specialized information retrieval systems developed in 1977 under HS&E. Both took six months to develop and become operational. Mary Cubillas, senior information technologist in HS&E's Information Services Department, has been largely responsible for the development of these two applications.

"When the new HS&E organization was formed in 1976, we were faced with boxes of reports to index and catalog," she explained. "These reports included internal Shell toxicology reports, reports from contract laboratories outside of Shell as well as reports from such organizations as the American Petroleum Institute.

"Though the reports are circulated among corporate toxicologists first, our department has the responsibility for their retention and retrieval. We had been using Inquire for several years for handling toxicological data and were glad to have its help with the mammoth task ahead of us.

"Step one for our group was to determine what elements of these reports should be indexed to meet the needs of the HS&E professionals. We developed a prototype system and presented it to the toxicologists for comment. What evolved was a system containing, in addition to bibliographic information, four types of classifications: chemical substance indexing, study classifications, subject keywords and an abstract which included toxicology data extracted from each report," Cubillas said.

Indexing of the chemical substance is extremely important in the Shell Oil Toxin application. Many times reports are retrieved from this system for submission to governmental agencies or for the evaluation of the toxicity of a chemical by the Toxicology Department. Retrieval must be precise, even though reports may refer to the chemicals by trade names, product codes or by varying chemical nomenclature.

The demand for product information continues to increase rapidly and as additional regulations are promulgated by federal and state agencies, the need for effective information systems to record and report this information will be more severe. We believe our Inquire-based Product Profile Information System will handle the increased volumes and let us satisfy these information needs cost-effectively.

[illegible] is manager of HS&E's Information Systems Department.

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[illegible]

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- ASI-INQUIRY: Heavy users of this [illegible] general purpose, IMS DB/DC interactive query language include Exxon, Hughes Aircraft, Standard Oil of Indiana, the National Security Agency (NSA), and Hydro-Quebec.

To apply, send your resume and cover letter stating salary requirements.

NOTE: Responses from recruiting firms neither solicited nor accepted.

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Re Conversion Functions

FCC Asks Comment

By Phil Hirsch

WASHINGTON
Communications
asked interested
whether some
functions should
services defined

Emulex Enters Front-End
With DEC-Compatible

SANTA ANA
entered the
ket by introducing
that provides
Corp's. DH11
line-handling
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The CS11 H
gives users of
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Line Adapters

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diagnostic and

(Continued

Line Printers for
and System Integrat
Improves Profit

[illegible] on Conversion Functions

[illegible]

pan[illegible] a separate Bell subsidiary *can* offer such a service (by leasing transmission from an operating company). Thus the discrimination allegedly imposed on Bell is more apparent than [illegible].

Adapso Agrees

Another argument was provided by Adapso in one of its earlier comments in the computer inquiry. "If AT&T [operating companies are] allowed to perform protocol conversion, then AT&T could selectively choose which protocols and codes it utilizes and thus could destroy the competitiveness of equipment and service offerings of others," it said.

Adapso argued further that letting the operating companies perform protocol code conversion for the end user would create immeasurable opportunities for cross-subsidization.

Bell, for example, could load the conversion software into its computerized electronic switching systems which now support telephone service. By allocating a disproportionate share of the related costs to telephone service — an easy task given the sad state of telephone accounting systems — Bell could offer protocol code conversion service for substantially less than its competitors.

Initial comments in the inquiry, formally known as Docket 80-756, are due next March.

[illegible] SAKE
[illegible] BOEING.

[illegible] We have [illegible] opportunities [illegible] control systems engineers [illegible] software engineers.
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BOEING

Multiplexer Runs On PDP-11, VAX

(Continued from Page 99)

sparency.

The unit supports asynchronous line interfaces of all types including RS-232 with full DM11-compatible modem control and current loop.

The system also provides for line parameters such as individual line speeds to 19.2K bit/sec using all commonly used transmission rates, split line speeds, character size from five to eight bits and stop bits one, one, 1.5 or two bits in size. The firmware programmable read-only memory used for the unit directly emulates the DEC DH11 functions, the firm said.

In addition, controller functions can be placed on one board that plugs into a single Unibus SPC slot as only one unit load on the Unibus. The single 34-conductor flat cable daisy chains up to four distribution panels which contain the line adapter circuitry.

The device provides improved performance, up to 19.2K bit/sec per line with a total composite data rate of 52,000 char/sec on a single controller. Multiple controllers may be used for increased capacity. A 64-character Fifo buffer is provided for each group of 16 received data lines.

A basic configuration of one controller and one distribution panel with adapters for 16 channels, all including modem control, is priced at $5,800. To expand in increments of eight lines, additional panel and an eight-line adapter costs $2,500. To expand in increments of 16 lines, an additional panel and two eight-line adapters is priced at $3,900. A 32-line system would cost $9,700, the firm said from 2001 E. Deere Ave., Santa Ana, Calif. 92705.

IBM 3270 Users:

Get on the PTS-2000 Growth Path.

And get one low-cost, high-performance terminal family that expands with your needs.

Imagine a single 3270-type product line that can be expanded in large or small increments, with functions that range from basic inquiry/response to multi-station, multi-peripheral operation, and with support, service, and pricing advantages that are unparalleled.

Hard to imagine?

Well look at Raytheon's PTS-2000 product family.

You install it just once, and then add the 3270-compatible capabilities you need as you need them.

Capabilities that start with BSC and grow on-site, to SNA/SDLC support. 3276/74/78 compatibility. Large display screens, up to 3440 characters. Enhanced 3270 function. Cursor select and 25th line features. Data rates up to 9600 bps. Numerous operator convenience and productivity aids. Built-in diagnostics. And a unique distributed-intelligence architecture that allows for rapid and significant future expansion.

The PTS-2000 display system supports 3276/78 small-cluster systems in both BSC and SNA/SDLC protocols, and 3274/78 large-cluster systems as well. It differs from all other terminals in its class in that the PTS-2000 is designed to be upgraded in modular fashion from single station or small cluster capability to large cluster, full function, enhanced 3270 capability without equipment swapout ever... easily and with significant cost savings always.

The PTS-2000 from Raytheon. A total economical solution, with fast delivery, from the company that has over 150,000 Intelligent Terminals installed. Find out more by calling your local Raytheon Data Systems sales office today. Or call us at 800-343-6676.

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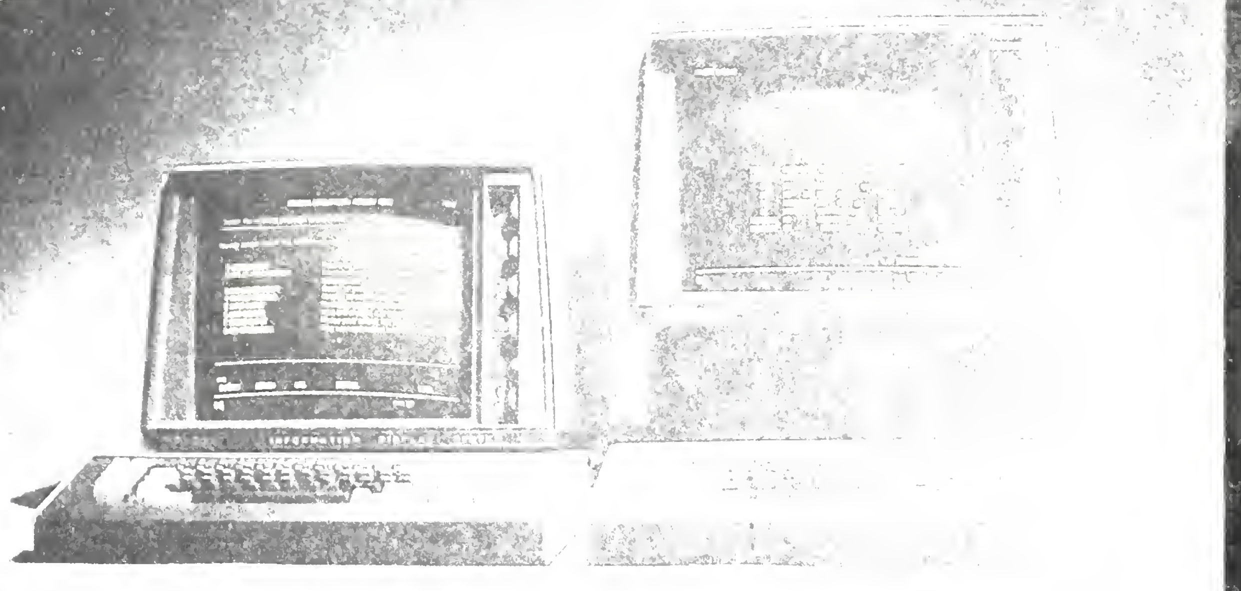

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□ Telecommunications Systems

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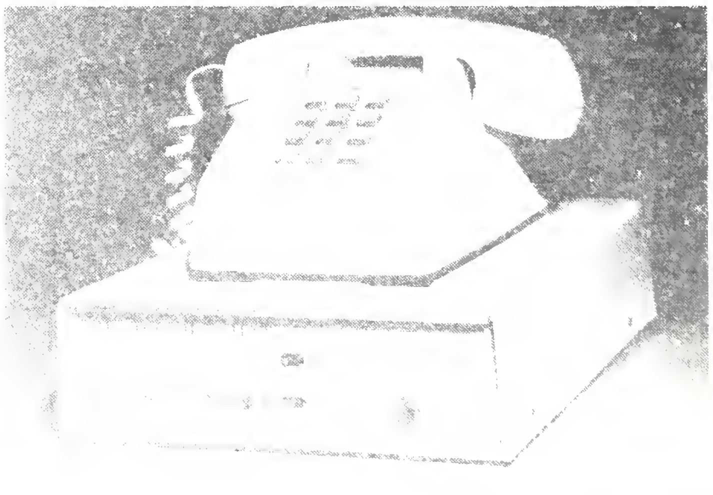
NORWOOD, MASSACHUSETTS 02062

Bell 212A-Type Modem Runs in Full-Duplex Mode

[illegible] and rack-mount- [illegible] and [illegible] capabil- [illegible] transferring [illegible] push [illegible] chassis [illegible] 502 [illegible] cost [illegible] New [illegible]



The MT212A Modem

Why Arizona State University decided not to [illegible] their mainframe to meet computer demands.

Distributed Processing with Digital. The right system for the job. Every job.

[illegible] can be tempting to [illegible] demand by upgrading [illegible] mainframe. But it's not [illegible] State University had [illegible]

Distributed Processing with Digital [illegible] your mainframe.

[illegible] PDP-11/70 systems for at our [illegible] Dave Tschoach [illegible] But we use them for the very large number of smaller timesharing jobs needed by the various departments on campus. Most undergraduate timesharing is now on Digital's systems. The mainframe computer we now reserve for higher level computing for batch-oriented applications. Thus we've been able to realize an increased effectiveness in the use of all our computer facilities."

James Hershauer, Professor of Quantitive Systems in the Business College likes the interactive capabilities his PDP-11/70 provides. "I estimate that nearly one-third of the students in programming courses have never done anything on a computer. That's why the PDP-11/70 is so valuable. Here are students sitting down to program for the first time in their lives. Perhaps they'll make 10 passes before they have a successful program. It helps them to have the immediate response of the timesharing system."

Distributed Processing with Digital means more availability.

Max Ivey, Director of Academic Computing Services, sees the PDP-11/70 systems solving future demands too. "We do see some probable areas of growing use as in research and statistical applications. Availability is what makes these systems so appropriate for academic use. They're perfectly suited to do the type of work that students do," he concluded.

So when Arizona State opted for distributed

DEC Offers CRT Units For News Applications

MERRIMACK, N.H. — Digital Equipment Corp. has announced a line of CRT terminals for newspaper applications. The VT173-C (for classified advertising) and VT173-R (for reporting) contain an LSI-11/2 microcomputer and offer display and text handling features, the vendor said.

The VT173-R, with 32K bytes of internal storage and 105-key keyboard, costs $5,195.

The VT173-C has 32K bytes of internal memory and [illegible] keys, it costs $5,995.

DEC is headquartered in Maynard, Mass. 01754.

For Interdata Processors

IEEE Bus Controll[illegible]

[illegible]

processing, they got several advantages.

First, the PDP-11/70 systems were tailored to their tasks. With interactive capabilities that made it easier for new students to learn. The university was also able to use their new and existing systems in a much more cost-efficient manner and subsequently installed 3 additional units.

Distributed Processing with Digital means more flexibility.

Distributed processing lets universities like Arizona State evaluate and meet their needs on a simple, year-to-year basis. They can purchase different capabilities as required by different applications, adding and reassigning computers to meet their demands. Which means they'll never have to commit to more (or less) computer than they need.

This is just one example of how Digital is committed to making the computer a practical, economical and accessible tool for education. We offer the industry's broadest and most widely used family of educational computers — from entry-level minis to 36-bit mainframes. Plus the networking tools to tie them together.

Our upward compatibility lets you grow in manageable, logical steps instead of awkward, costly leaps. It also lets you steadily increase services while protecting your basic investment.

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Distributed processing with Digital.
The strategy that meets your demands
as well as your budget.

digital

[illegible] Communications Managers

[illegible] experience in data communications [illegible] communications development.

[illegible] reporting to the network man- [illegible]

[illegible] manager for communications software. This person [illegible] maintenance, documentation [illegible] and enhancement [illegible] computer center's communications [illegible] and leads communications [illegible] various projects.

The section manager for communications software needs a knowledge of systems analysis and programming methodology, should be a stickler on detail and accuracy, know how to plan and schedule software development and understand real-time software design as well as data communications protocols, equipment and facilities. For this job, five years professional experience beyond a bachelor's degree is also preferred.

Reporting to the section manager for communications software is the communications software specialist who is essentially a communications-oriented programmer with an associate degree or at least three years experience in software development and maintenance.

On a par with the communications software manager and also reporting to the network manager is the section manager for network equipment, Moulton continues. He or she directs installation of all data terminals and monitoring of their performance. Moulton considers an associate's degree or three years of college sufficient.

The network equipment section manager supervises computer terminal technicians and a network equipment coordinator. The latter dispatches and logs all service calls and schedules all installations and moves of equipment.

Another individual reporting directly to the network manager is the section manager for special projects, who is responsible for performance and implementation of special projects aimed at improving network effectiveness and reducing network costs. A consummate data communications professional, this person needs at least six years' background in the business and a bachelor's degree in computer science, engineering, mathematics or natural science.

The special projects section manager oversees communication system specialists, who generally have the same schooling but fewer battle scars. If they don't know it all, they should think they do and gracefully make up the difference.

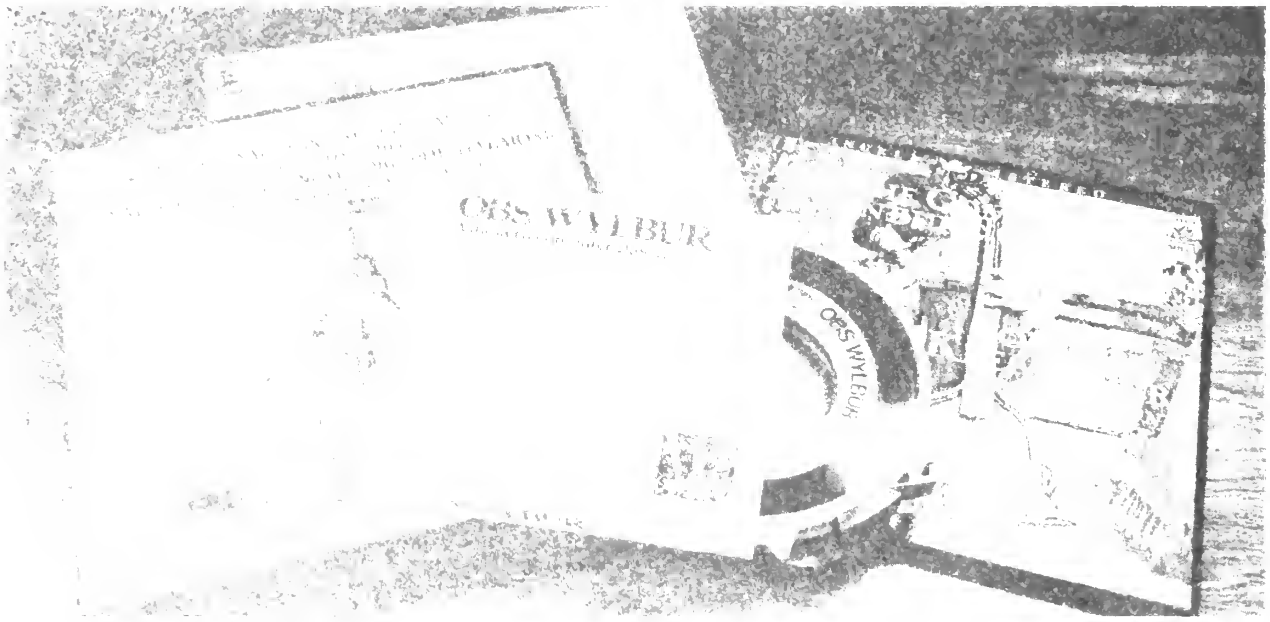
The final job slot reporting directly to the network manager in Moulton's scheme is the section manager for technical control. Responsibility is for operation, maintenance and enhancement of the computer center's technical control facility along with local and remote data communications facilities. This person troubleshoots crises, much like Scotty on the *Starship Enterprise*.

The post's duties include direction of patch-ups, post mortems and scheming for better gear. The technical control section manager needs savvy in both analog and digital communications and an ability to lead people. Education should approximate a communications-related bachelor's degree.

Reporting to the section manager for technical control is the communication engineer, senior network technician and network technician. The communication engineer is there to size up sudden problems and direct the technicians in solving them. All three can make good with a high school diploma and a six-month stint in an appropriate trade school, Moulton suggested.

Advances in Data Communications Management, Volume One also features useful descriptions of most well-known network architectures, protocols, packet-switched circuits, network architectures, protocols, packet-switched circuits, network services and links that leave the Earth.

More information on this book, *Advances in Distributed Management*, *Advances in Computer Security Management* and other books in the series edited by Rullo, is available from Heyden & Son at 247 S. 41st St., Philadelphia, Pa. 19104.



"[illegible] WYLBUR is a classic. It cut costs [illegible] programmer productivity."

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The solution was found by provid
on-line capabilities to the four
bureaus and also to five others whi
resulted in a significant amount of
time responsibility and workload
taken away from data entry and operations and returned to the user

One of the key benefits is that users are no longer forced to compete for priority status among the various operations and audit bureaus and can schedule their own sessions and set their own priorities independent of other bureaus and MIS schedules. Simultaneously the computer is now free to process other applications

The advantages are twofold. Not only have the user bureaus helped, but the computer center no longer needs to modify its operations schedule for the shifting priorities of those projects currently on-line

Racal-Milgo
Racal-Milgo
Racal-Milgo

Racal-Milgo, the world leader in data communications presents the new 4270 Cluster Terminal System including. Controller, four Display Stations and two 2400 BPS Modems

It's 3270-compatible, expandable to 32 devices and upgradeable to SDLC SNA. We'll install it within 60 days and include maintenance too. All for just $36? a month on a 60-month lease

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Touch-Sensitive CRT Units Quiet Library Access Woes

Special to CW

EVANSTON, Ill. — The Evanston Public Library has long been a leader in bringing its resources up to date in the [illegible] In 1896 the library [illegible] its card catalog, based on [illegible] published Dewey decimal [illegible] classification to replace [illegible] In 1920 [illegible] library to em[illegible]

[illegible] began [illegible] catalogs [illegible] CRT terminals [illegible] library patrons [illegible] entries in [illegible] books [illegible]

Unlike most terminals, the touch-sensitive terminals do not require keyboards. Each terminal screen is divided into a number of areas, each one displaying a particular information category. When a library user touches the area corresponding to the type of information he wants, the information is displayed in large bright characters on the screen.

Designed for use by people unfamiliar with computer equipment, the terminal screen guides patrons through their choices. The user initiates a search of the library's holdings by touching with a fingertip one of three categories, author, title and subject, displayed on the screen. In doing so, the user begins to access the on-line data base of the library's host computer.

After this initial selection, a list of key words appears on the screen from which the user selects the one preceding the desired entry. As the process is repeated, the search is narrowed until the desired entry appears. The user can then obtain full information about the particular selection, including its location and availability.

Favorable Reports

In use since October, the terminals are getting favorable reports from the library's users. According to Jane Greenfield, adult services coordinator for the library, patrons making use of the new on-line information system can get more complete and more current information than was possible under the traditional catalog system.

Users interested in a particular title, for example, can learn from the terminal whether it has been checked out and whether other copies can be obtained at one of Evanston's three branch libraries. Some patrons have even done empirical research, first checking out a book, then running back to a browsing terminal to see if the check-out had been recorded on the system.

The touch-sensitive terminals are currently installed in the library's main lobby, the reference room, the art room and the children's room. While some of the library's adult users at first hesitated to make use of the browsing terminals, younger patrons have been enthusiastically exploring its capabilities from the start.

According to the library's public relations coordinator B.J. Jahnke, "It has been fun to watch children line up to use the terminals. They are totally thrilled with its possibility and we've found in our suggestion box comments like 'absolutely fantastic.'"

Designed to be "patron-proof," the terminals have no exposed switches, wires, dials or knobs to intimidate users. According to Greenfield, the terminals are actually more resistant to damage from users than the library materials they help users locate.

Once library users have become accustomed to using the new terminals, the old card catalog will be eliminated.

"Initially, having both versions of the catalog let our users become accustomed to on-line catalog at their own pace," Greenfield noted. "For some people, that made the transition more pleasant."

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business colleagues and get the point across
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easy-to-read graphs. Just follow the step-by-
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LOOK AT THESE FEATURES:
Pie Graph
- up to nine shading patterns and 100 "slices"
- user may "explode" slices from pie
- automatic percentage calculation

Bar Graph
- up to 100 items (worded and/or numbered)
- up to five bars per item
- choice of vertical bars or horizontal bars
- choice of normal, stacked or comparative
- graphs can be zero-based or used for scheduling

Linear Graph
- up to five lines in eight styles (dashes, dots, solids, etc.)
- up to 100 coordinates
- choice of "scattergram" or connected points.

Graph Annotations
- add custom finishing touches to graphs
- can be used to create forms and text.

more information
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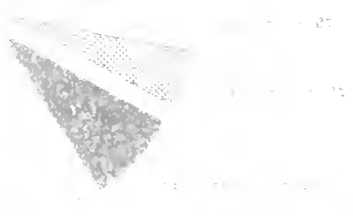

Timberline

IBM Constructs Superconductors To Push Limits

YORKTOWN HEIGHTS [illegible] — Scientists at IBM's Thomas J. Watson Research Center here have constructed experimental superconducting magnetic sensing devices whose operating characteristics reportedly approach limits imposed by fundamental laws of physics.

When incorporated in complete measurement systems, the devices could permit measurement of changes in magnetic fields as small as one [illegible] lionth of the field of the earth when those changes occur at frequencies above 10 KHz. This represents a 10 [illegible] in sensitivity over [illegible] measurement systems [illegible] magnetic sensing de[illegible] application areas that [illegible] ics, biomedicine and pure [illegible]

The devices belong to [illegible] conducting quantum [illegible] vices (Squid) which [illegible] ducting metals tha[illegible] tance at temperatur[illegible] zero (273° below [illegible] Squids have been used [illegible] ations in the magne[illegible] surface, which is [illegible] for geothermal ene[illegible] erals and possibly [illegible] tion. They have been [illegible] heart and brain [illegible] graphy and magneto[illegible]

Squids have also been [illegible] voltage comparisons [illegible] million and current [illegible] part in one billion. [illegible] have played roles in [illegible] gravity waves and in [illegible] fractionally charged [illegible] be the building blo[illegible] ticles such as neutr[illegible] have also been us[illegible] netic materials. Sig[illegible] in Squid perform[illegible] tially, both practic[illegible] tance.

Advances [illegible]

The advances [illegible] ported to the [illegible] munity by several [illegible] beginning early [illegible] lated further work [illegible]

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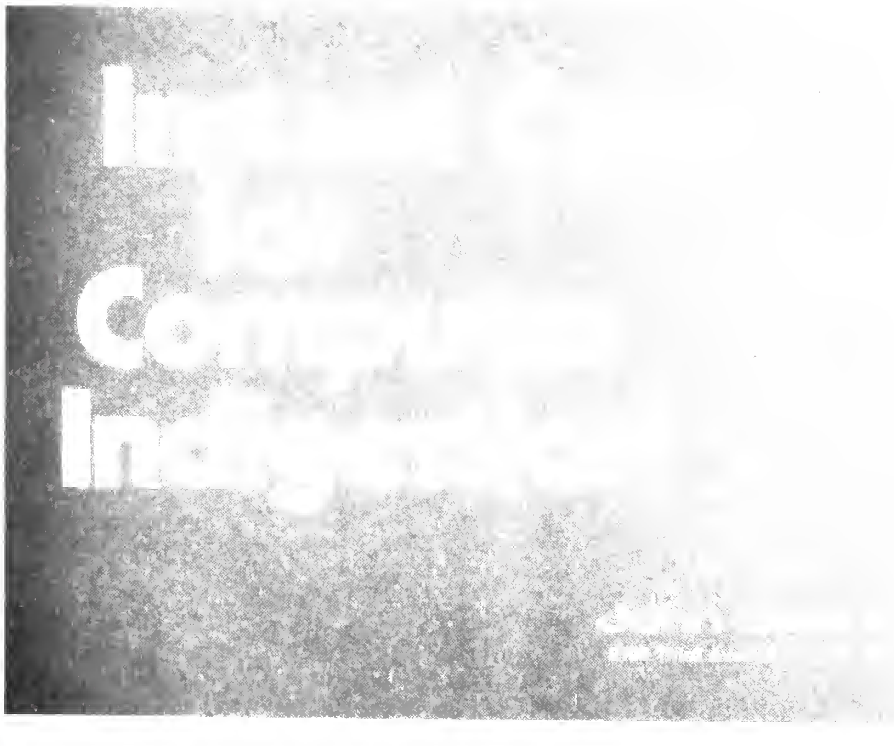

[illegible] Cleans Up

Pricing Control Motivates Switch to DDP

[illegible] sts and light [illegible] as pro- [illegible] then [illegible] said [illegible] contract [illegible] it [illegible] companies [illegible] would [illegible] questionnaires [illegible]

bring equipment and personnel to the job, he said.

While the answers to all of these questions can often be found in the accumulation of ABM's experience, it is essential to make that information available where and when needed, he said.

Until 1973, when the federal government enacted wage and price controls that required extensive documentation, the necessary data was not available in any central processing system, [illegible] noted.

The first tentative steps were taken toward DDP in early 1976 when Bernd Bremer, director of management information systems (MIS), consolidated three separate DP systems operating in San Francisco and Seattle. They were replaced by an NCR Corp. N-8450 computer at ABM corporate headquarters in San Francisco. The system was upgraded to an NCR V-8550 and that in turn was replaced by Model V-8555-M, Bremer said.

"We took advantage of NCR's migration path engineering to gain the power and memory we needed as we began building a data base to perform the routine applications our companies use today. Simultaneously, we laid the groundwork for a true DDP system," he continued.

The current configuration is a multiprocessor that employs Virtual Resource Executive (VRX) firmware to handle a remote job entry (RJE) network of data display terminals and impact printers with a 1.5M-byte mainframe.

Although ABM needed to provide local managements with a system for controlling data entry that allowed for allowed for timely information retrieval, it was impossible to implement it all at once, Bremer noted.

Critical Point

"The initial applications were the most criticle and included payroll, accounts payable and receivable, job costing, general ledger, workers' compensation and stock option plans. Getting these programs going allowed us to begin building a data base that could serve both central and local management," he said.

Data entry and retrieval was initially handled off-line with companies keying entries to disk and transmitting to the corporate offices via teletype, he explained. The information was transferred to computer tape and used to updated the various files involved, he said.

Some processed data was transmitted back to the local companies for check printing while management reports generated from the same data were printed at the corporate computer center and delivered by courier service.

By mid-1979, some 30 ABM offices were using the central computer resource for data processing. The first RJE data display and printer terminals were installed in departments at corporate headquarters in Sacramento and Fresno, Calif.

Installations at other ABM companies in Phoenix, Albuquerque, N.M., Seattle, Los Angeles and Denver were slated for completion in early 1980 and by the beginning of 1981 Bremer estimated that some 40 RJE stations would be on-line.

The overall plan is to develop programs that allow companies to link into the central computer while maintaining individual identities, Bremer said. "Each organization has its own way of doing things due to such factors as different union rates, state laws and unique company histories," he said.

Bremer allows programmers and systems analysts free access to computer time for developing software because this encourages the programmers to use hands-on experimentation.

While some auditors might not approve of this use of computer time, he feels that the policy has paid dividends in creative programming for ABM.

"[illegible] new VISUAL 400 [illegible] the industry's finest line of video terminals."

[illegible] Character or block mode. 80 or 132 [illegible] double wide characters. Super [illegible] Programmable function keys. We emulate [illegible] ADDS. Chances are we've got the right [illegible] and see for yourself."

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[illegible] Switchable Emulations

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- [illegible]
- [illegible]
- [illegible]

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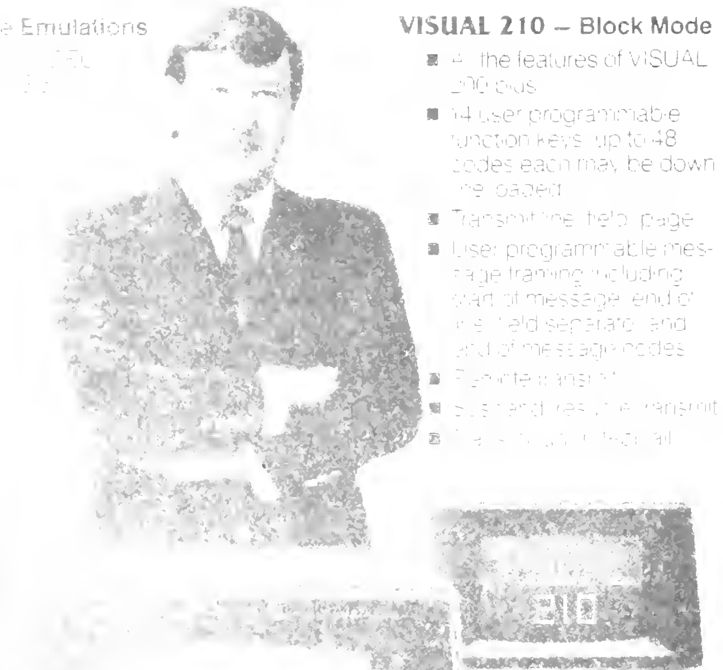

“We switched to [illegible]

Frank J. Sanzone Jr., Car[illegible]

SANZONE:
We switched to an NCR computer for several reasons. First, we had to have an interactive system. And only NCR seemed to offer true interactivity with the power we needed.

NCR's MONOGUE:
And with the capa[illegible] grow.

SANZONE:
Second, we ha[illegible] gap in our vend[illegible] of systems, s[illegible] facing a diffic[illegible] sion any way [illegible] With NCR, w[illegible] would not ru[illegible] of gap again

NCR's MON[illegible]
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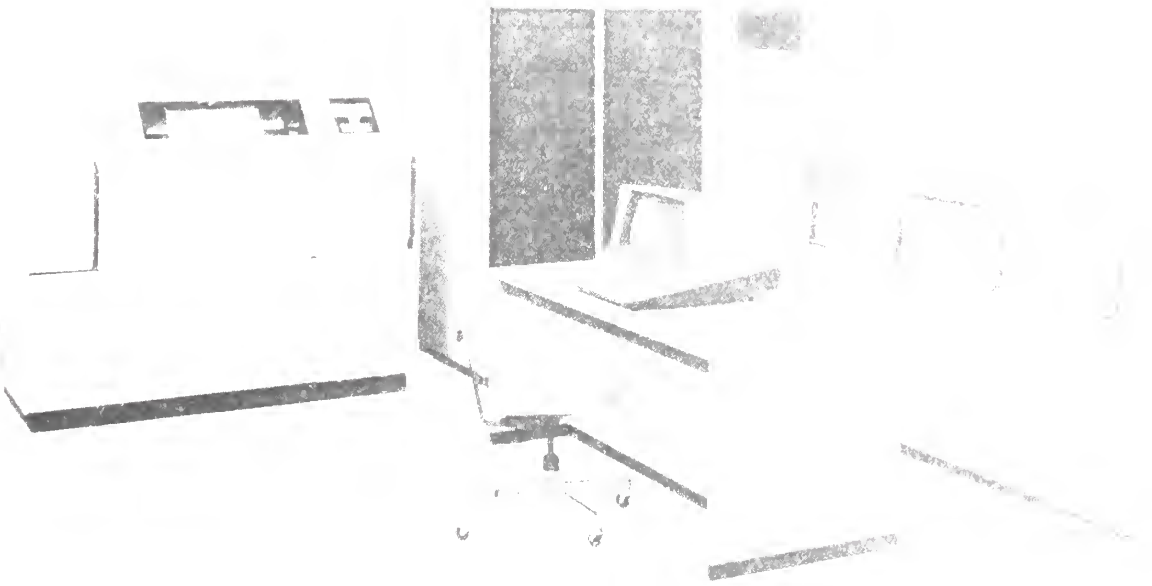

An NCR computer can [illegible]

[illegible]n Replaces Light Tables, Paper

[illegible] dw[illegible] no don[illegible] [illegible] He [illegible] developed a spe[illegible] [illegible] stem for at[illegible]

[illegible] makes it possible to specify distances and [illegible] types and will automatically insert them [illegible] proper locations.

[illegible] CRT terminal [illegible] two separate [illegible] allows the [illegible] the cursor to ex[illegible] X or Y direction with [illegible] tachment to the digitizer. The lights, which are positioned behind the menus on the digitizer, help the user remember which control commands are in effect.

For the future, Arrigoni is in the midst of developing a scratch pad station to provide even greater design flexibility. This station will be built around the digitizing capability of the Tektronix 4003 plotter digitizer, several more of which are on order. The firm is also acquiring two Tektronix 4054 graphics computers that feature 19-in. screens.

Pilgrim Offers
[illegible] Device

DECwriter IV.
The terminal that's easier to use is now easy to buy.

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512 [illegible]

VIRGINIA
Richmond
[illegible] Hughsmith & Co
804/272-5888

WASHINGTON
Redmond
Consolidated Data Terminals Inc
206 [illegible]

Seattle
Datec
206 575-1470

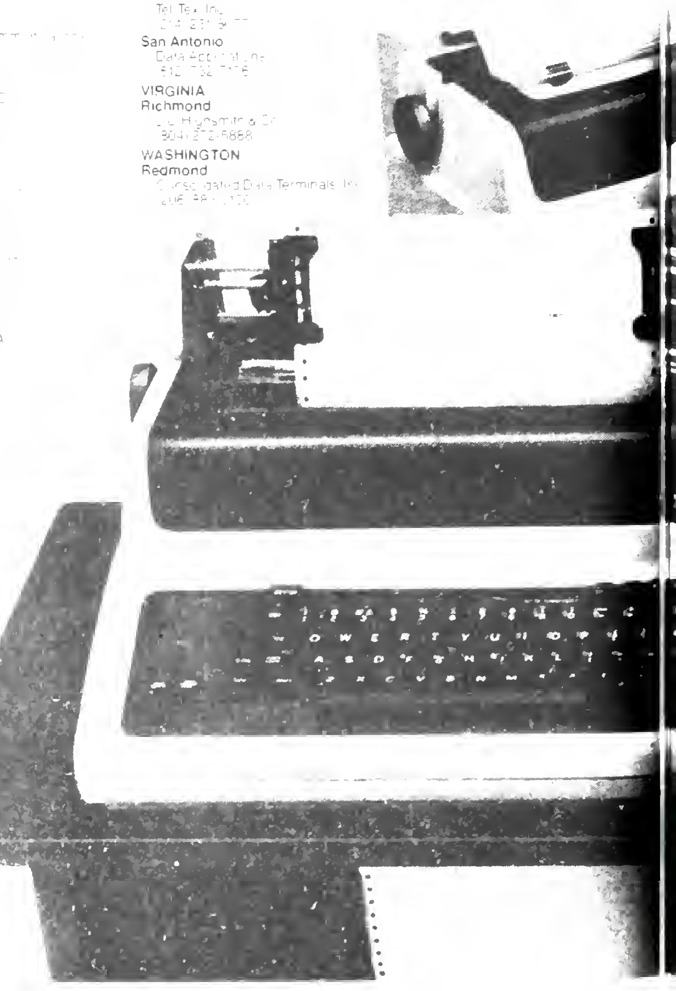
WISCONSIN
Milwaukee
Lorinam Associates Inc
(414) 548-3790
Tele-Terminals
800 328-3072

CANADA-BRITISH COLUMBIA
Burnaby
Algo Communication Products Ltd
(604) 438-3333

CANADA-ONTARIO
Markham
Canterm Communications
416 495-5700
CES Electronic Systems Group Ltd
416 495-5555
Lanpar Ltd
(416) 495-9123
Teleterm Ltd
416 495-5666
Mississauga
Data Terminal Mart
416/677-0184
Toronto
Hamilton Rentals
416/251-1166

CANADA-QUEBEC
Montreal
Spectra Colour Ltd
514/739-2153
Telcor
(514) 337-6020

CANADA-MANITOBA
Winnipeg
Electro Systems Group Ltd
204/772-9411



Interactive, Color Raster System

Scaled-Down Whizzard Offers [illegible]

SAN DIEGO — Megatek Corp. today introduced an interactive, line drawing color raster display system that is a scaled-down version of its Whizzard 7250 system introduced earlier this year.

The Whizzard 6250 system incorporates many of the features of the large-scale 7250 raster display system, but is designed to be an entry-level computer-aided design (CAD) and computer-aided manufacturing (CAM) device.

The 6250 has a 13-in. color display monitor rather than a 19-in. model and up to 64K bytes of vector memory instead of the maximum 192K bytes offered by the [illegible] computer.

The 6250's 14-slot [illegible] includes a graphics [illegible]

It's easy to understand [illegible]
IVs are so popular. In addition [illegible]
productive, versatile, and [illegible]
DECwriters are easy to [illegible] The [illegible]
easy to maintain. And [illegible]
another easy feature [illegible]

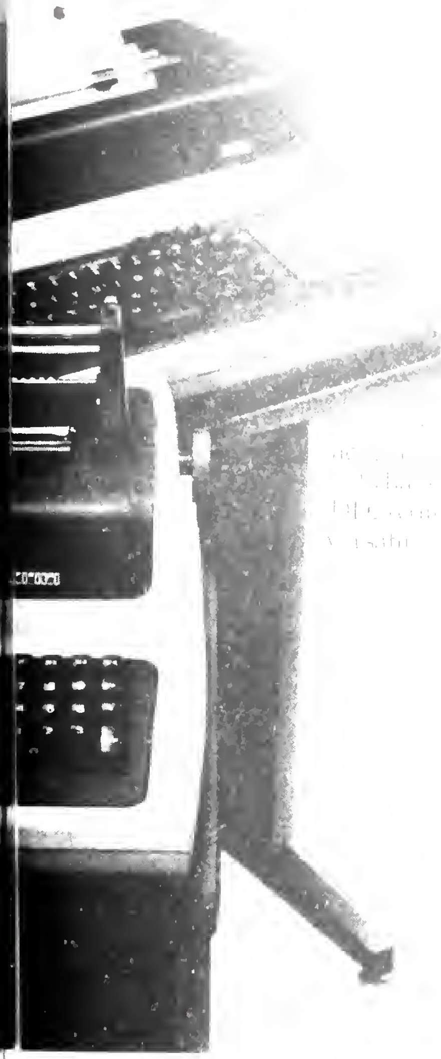
Just look through [illegible]
nearest you. Chan[illegible]
your area. Call and [illegible]
Digital teleprinter [illegible]
low price.

The DECwriter [illegible]
processor contro[illegible]
formance and [illegible]
made Digital's [illegible]
best sellers from [illegible]
turers in the [illegible]

A DECwriter [illegible]
do it yourself [illegible]
dealer or field [illegible]

And it's eas[illegible]
the feel and op[illegible]
snap-in ribbon [illegible]
clear charact[illegible]
lightweight [illegible]

Yet while [illegible]
Digital's term[illegible]
ter set; gives [illegible]
baud rates; [illegible]



[illegible]ctors Push Limits of Natural Laws

[illegible] Dr. [illegible] N. Broers.

[illegible] Squids discussed here consist of [illegible] two Josephson elements connected to [illegible] form a ring of superconducting [illegible]. Each Josephson element [illegible] two superconducting electrodes [illegible] by a weak link [illegible] thin layer of insulator that [illegible] between the [illegible] "tunnel junction" [illegible] superconducting [illegible] between coplanar [illegible] nanobridge).

[illegible] rise to so- [illegible] effects by [illegible] of electron [illegible] up to some max- [illegible]

sephson tunneling and magnetic-flux quantization. In the latter phenomenon, when a superconducting ring is placed in an external magnetic field, supercurrents are set up in the ring such that the net magnetic flux (magnetic field times area) through the plane of the ring takes on values that can only be integral multiples of a fundamental unit of magnetic flux called the flux quantum.

The essential point, according to the researchers, is that fields external to the Squids affect the supercurrents through them. The fields change the maximum amount of supercurrent that can exist in the Squids. Currents greater than this critical supercurrent cause Squids to enter the nonsuperconducting or voltage state.

[illegible] complete measurement system [illegible] used to extend the versatility [illegible] Squid for measurement [illegible] voltage and cur- [illegible] to optimize magnetic- [illegible]. Overall system [illegible] sensitivity depends [illegible] circuit as well as the [illegible] near-ultimate [illegible] Squids conse- [illegible] importance of [illegible] input circuit for the [illegible] system [illegible].

MIT Input Scheme

[illegible] Ketchen, together [illegible] an MIT grad- [illegible] IBM most re- [illegible] an optimized in- [illegible] scheme. They devised [illegible] for lithographi- [illegible] a lead-alloy thin- [illegible] directly above a [illegible].

[illegible] ultimate limit to the sen- [illegible] Squid sensing device. It [illegible] example, from random motion of electrical charge produced [illegible] at elevated temperatures [illegible] absolute zero noise [illegible] zero-point fluc- [illegible] manifestation of the uncer- [illegible] of quantum me- [illegible]

The IBM researchers showed that the noise in the niobium nanobridge Squid is only somewhat greater than the limit set by fundamental physical theory.

In agreement with circuit theory, Squid noise reduction was a result of decreased size of the Josephson elements as well as optimization of circuit parameters. The cross-sectional area of the weak links in the nanobridge Squid — that is, the cross-sectional area of the metallic stripes — was 0.001 square micrometers. For the lead-alloy tunnel junctions, the weak link or insulator area was 10 square micrometers. Finally, for the niobium tunnel junctions, the weak-link area was 1.0 square micrometers.

The reported low-noise behavior has been demonstrated only when magnetic-field changes occur at relatively high frequencies (10 kHz to 100 kHz). At sufficiently low frequencies, performance of all devices is degraded by the presence of so-called 1/f noise.

Measurements of the 1/f noise have been made for the lead-alloy Squid by Ketchen and Dr. Chang C. Tsuei. This noise was found to be comparable to that in commercially available Squids, indicating that the strength of the IBM Squids is in their higher frequency.

Drives Offer 65% Capacity Gain

Ontrax Unveils 136M-Byte [illegible]

By Tim Scannell
CW Staff

SUNNYVALE, Calif. – Ontrax Corp. last week unveiled a [illegible] of 8-in. Winchester disk drives that offer up to 136M bytes of storage, a capacity said to be more than 65% greater than the present highest capacity [illegible] disk drive.

The Ontrax drives are [illegible] in three models, ranging [illegible] two-platter 34M-byte [illegible] the highest capacity unit [illegible] platter model. They are [illegible] petitively targeted at [illegible] keted by Control Data [illegible] Century Data Systems [illegible] Ampex Corp. The Ontrax [illegible] ings, however, are [illegible] aimed at Fujitsu Ltd.'s [illegible] 8-in. Winchester drive [illegible] the previous capacity [illegible] the-hill, according to [illegible] the firm's vice-president [illegible] keting.

The high-capacity Win[illegible]

Drive's Heart

[illegible]

Decsystems Get Controller, Printer Line

MENLO PARK, Calif. – A plug-compatible controller and line of printers for Digital Equipment Corp. Decsystem-10 and Decsystem-20 users are available from BDS Computer Corp.

The LPC-20 micro[illegible]-based controller handles printers with speeds of 300, 600, 900, 1,200, 1,500 or 1,800 line/min compared with DEC's controller, which services 300- or 1,200 line/min printers, according to the firm.

The LPC-20 is said to be fully software-compatible with the Tops-10 and Tops-20 operating systems. It controls any of BDS' line printers from 300- to 1,800 line/min requiring only jumper or cable modifications, a spokesman said.

The LPC-20 controller costs $6,500. Printing systems range from $10,250 for a 300 line/min device to $33,500 for 1,800 line-/min units. BDS is located at 1120 Crane St., Menlo Park, Calif. 94025.

Controller for Unibus Performs DMA Transfers

ORANGE, Calif. – MDB Systems, Inc. has [illegible] troller module for Digital Equipment Corp. Unibus [illegible] that reportedly performs DMA data transfers [illegible] oriented peripherals [illegible] printers, plotters, graphic [illegible] nals and plasma displays.

The MDB PDI-11 offers PLC compatibility. On a PLC [illegible] the PDI-11 allows a peripheral device to appear to the [illegible] like a DEC DL serial line [illegible]

This means the user can integrate the product into th[illegible] and run a peripheral with [illegible] ing software while DMA soft[illegible]

DG Offers Backup Drive[illegible]

[illegible]

THE RIGHT COUPON TO CLIP FOR [illegible] SMARTEST CHOICE IN TERMINA[illegible]

Our GT-400 [illegible] General Terminal Corporation [illegible] terminal. It's Z-80 based and uses ANSI X3.64 [illegible] EIA RS-232 compatible. Features include block [illegible] programmable function keys [illegible] 19200 bps.

For more information [illegible] GTC [illegible] CA 92680. Or call toll-free: In California (800) 432-7006. Elsewhere [illegible] 800-854-6781. Ask for Sharon Mills. In Canada [illegible] Road, Markham, Ontario L3R 1G7 416-495-9123.

General Terminal Corporation
The right button to push.
GTC

[illegible] QUENCH Between [illegible] Disaster.

[illegible] Fire Extinguishing Systems
[illegible] Systems That Offer:

[illegible] systems are now U.L.
[illegible] and FM approved
[illegible] and the name of
[illegible] QUENCH representative

FIREQUENCH
[illegible] Products Corp
[illegible] South 10th Street
[illegible] Springs, Missouri 64015
(816) 229-3405

Small Business Systems Speed Insurer's Claims Work

BOSTON — By installing small business systems in some of its branch offices, Liberty Mutual Insurance Co. has speeded its processing of worker's compensation claims by 45% and increased accuracy by 75%.

Prior to installing the systems, new clerical personnel had to be hired whenever the information handling load increased, according to Bob Taylor, manager of technical research at the company's Boston headquarters.

Traditionally, Liberty Mutual clerks identified which claim a piece of mail was related to through the use of master index cards. The cards listed alphabetically all the employers covered by Liberty Mutual. The employer's card would be followed by cards on each of their employees who had a claim.

This manual system required many clerks scanning hundreds of index cards to match the claimant's name with the policyholder's name. A piece of mail might pass across 15 desks before a match was made, Taylor said. If clerks came up empty-handed, the company had to write back requesting additional information.

As a result, it would often take from four- to six weeks to complete the file on a claim and finally get a check into the mail.

Index System

Last fall, the Dallas and Houston offices each installed a Texas Instruments, Inc. DS990 Model 1 Small Business System to handle the Workers' Compensation Claimant Index System, according to Bill Walker, claims manager at Liberty Mutual's Dallas and Houston offices.

Based on TI's TMS 9900 microprocessor, the DS990 Model 1 computer incorporates a 1,920-char. video display, 64K bytes of random-access memory with parity, and an optional 30 char/sec internal thermal printer. Mass storage is provided by two- or four double-sided, double-density diskette drives in a separate tabletop chassis. Maximum diskette storage on the Model 1 is 4.6M bytes.

Application software for claimant indexing was developed in TI's Terminal Programming Language (TPL) by Liberty Mutual programmers. TPL software consists of two parts: forms and procedures.

TPL Forms is used for drawing VDT-oriented data entry forms with field-editing specifications determined through operator-prompting menus. TPL Procedures is an English-like processing language supported by an interactive text editor, program compiler, and object module linker.

The Model 1 also supports SBC Basic, TX5 Basic, DX5 Cobol execution, TX5 Fortran, 990 Assembly Language and Pascal execution.

Liberty Mutual clerks now identify which claim a piece of mail is related to through the claimant index system on the computer. The clerk simply keys in the name of the claimant. The computer automatically lists the claimant's name, policyholder's name and address, date of injury, file number of the claim file and code number for the supervisor handling the claim on the screen.

Multiple Claimants

If there is more than one claimant with the same name, the computer lists information on all of them. By matching information from the correspondence (such as date of injury or location) with the information on the screen, the clerk can quickly determine which claimant (and therefore which claim) this piece of mail is related to.

If the claimant's name is not on the computer, the clerk knows that Liberty Mutual has not yet received the accident report from the employer. In that case, the clerk holds the piece of mail and tries again in a few days. In the past, trying to match a piece of mail to

(Continued on Page 116)

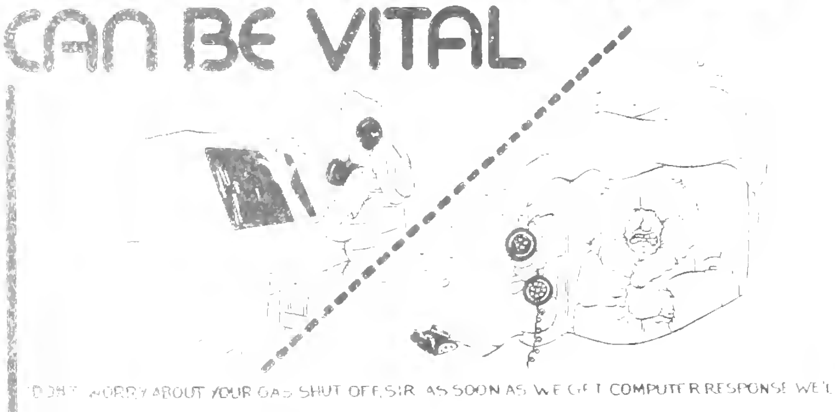
Don't buy a small business computer!

[illegible] Association of Computer Users' [illegible] of 24 of the [illegible] computers [illegible]

[illegible] free [illegible] today.

ACU HAS THE FACTS

RESPONSE TIME CAN BE VITAL



"DON'T WORRY ABOUT YOUR GAS SHUT OFF, SIR, AS SOON AS WE GET COMPUTER RESPONSE WE'LL ..."

HERE'S HOW TO MEASURE IT:

We manufacture a full line of Response Time [illegible] equipment for data communication lines. [illegible] portable or modular rack mount equipment capable of monitoring [illegible]

QUESTRONICS, INC.
3565 South West Temple Salt Lake City, Utah 84115 (801) 262-9923 TWX 910-925-4000

Mini Bits

Management System Designed to Aid Doctors

PHOENIX – [illegible] Systems, Inc. [illegible] management computer [illegible] specifically for doctors [illegible]

The System 6000 [illegible] speed up receivables [illegible] improve physician [illegible] handle paperwork [illegible] claimed. It handles [illegible] reports, receivables [illegible] receivables day [illegible] Cross/Blue Shield [illegible] spokesman said

The system costs $13,[illegible] Information Systems [illegible] ond Ave., Phoenix, Ariz. [illegible]

Double-Density Minidisk Out for Microcomputers

MITCHELL, S.D. – [illegible] double-sided, double-[illegible] minidisk for microcomputers [illegible] able from Syncom [illegible] of the vendor's E[illegible]

The disk was designed [illegible] life of up to 10 million [illegible] hard- and soft-sector [illegible] vendor claimed [illegible] engineered E-Z [illegible] Tyvex envelope [illegible] duced abrasion and [illegible]

The disks cost [illegible] pending on configuration [illegible] said from P.O. Box [illegible] 57301

Callan Desktop Workstation Features Built-In Card Cage

WESTLAKE VILLAGE [illegible] desktop, integrated [illegible] cluding intelligent [illegible] in card cage is available [illegible] Data Systems

The CD100's card cage [illegible] Intel Multibus or [illegible] Corp. LSI-11 Q-bus [illegible] includes, as an option [illegible] mini-floppy disk drives [illegible]

Compatible CPUs include [illegible] 8080, 8085, Z80, 80[illegible] DEC's LSI-11 series [illegible] of the LSI-11/2 or the LSI-11/2[illegible] unit costs $3,195 with [illegible] and $3,795 with two [illegible] from 2637 Townsgate Road, Westlake Village, Calif. 91361

Floppy Disk Controller Bows For Teac FD-50 Disk Drives

MONTEBELLO, Calif. – Teac Corp. of America has unveiled a 5.25-in. floppy disk controller for use with its FD-50 series 5.25 floppy disk drives

The FC-50 controller can be used with single- or double-sided drives and has the capability to read, write and format single- or double-density disks, the vendor claimed

It costs $480, the vendor said from 7733 Telegraph Road, Montebellow, Calif. 90640

Standby Power Systems Line Fit Micro, Mini Users

NECEDAH, Wis. – Best Energy Systems for Tomorrow, Inc. is offering a line of automatic standby power systems for microcomputer and minicomputer users

The Best models include the B12-1000 SPS5, B12-1000 SPS 25, B24-1000 SPS 5, B24-1000 SPS 25, BR24-2500 SPS 5 and the BR24-2500 SPS 25. Features include crystal con-

The Wang VS co[illegible] puts the cr[illegible] on your da[illegible] without putt[illegible] the squee[illegible] on your sta[illegible]

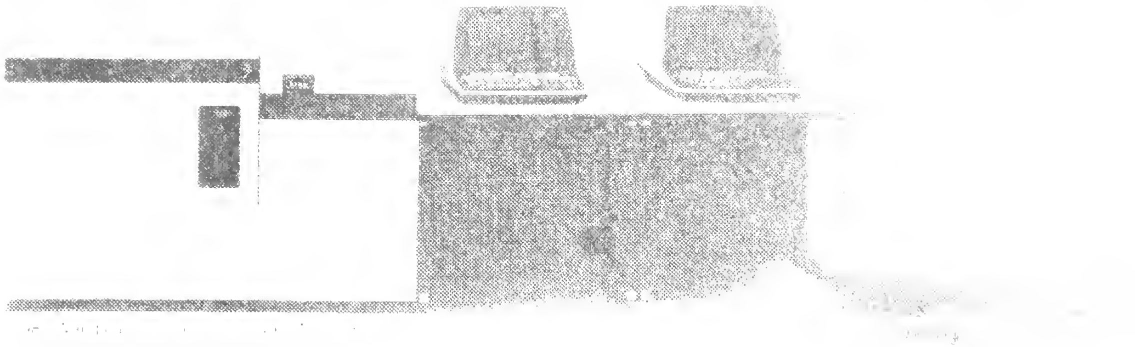
The Crunch

[illegible]

Expans[illegible] support on the [illegible] the VS to 128 user support [illegible] 100 systems. Use up to 2 [illegible]

Unsqueezed

[illegible]

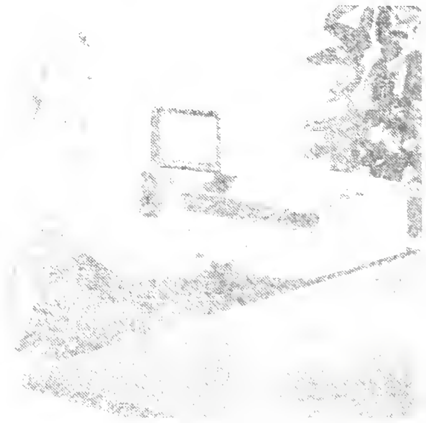


PACS
[illegible] your problem of Resource Chargeback.
[illegible] Chargeback
[illegible]

For Small Businesses

Durango's Colt Desktop Available at Computer Store

BURLINGTON, Mass. — Durango [illegible]


The Colt Desktop

The [illegible] unit [illegible] including video [illegible] processor and [illegible] costs just under $10,000, [illegible] spokesman said.

The Computer Store is located at Suite G-2, 57 Mall Road, Burlington, Mass. 01803.

Insurer Speeds Claims Work

(Continued from Page 114)

[illegible] was [illegible] involved [illegible] Periodically, [illegible] of the computer's easiest [illegible].

"Our new system is about 45% faster and about 75% more accurate than the manual indexing system. It's one of the better improvements added in the 27 years I've been with the company. With this system, we can get through [illegible] on the same day," Walker said.

With an eye toward the future, Walker added, "Our small business system supports two disk drives which can house up to 16,000 files. Right now it houses only 5,000, and that leaves a lot of room for programming. We could save a lot of time in other operations with more programming."

Follow-up studies by the Liberty Mutual home office show that in terms of man hours alone, each DS990 Model 1 will pay for itself in less than a year, with cost savings of $13,000 a year afterward. Since the first two Model 1s were installed last year, Liberty Mutual has implemented 11 more nationwide.

500,000 Shares

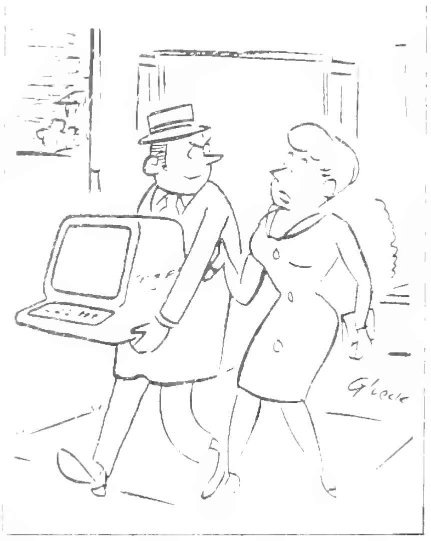
DREXLER
Technology Corporation

Common Stock

[illegible] per share

[illegible] Securities

[illegible] Paine Webber
Incorporated
Dillon, Read & Co. Inc.
[illegible] & Company Inc.
Kidder, Peabody & Co.
Incorporated
[illegible] Towbin
Smith Barney, Harris Upham & Co.
Incorporated
Dean Witter Reynolds Inc.
[illegible] Hallgarten, Estabrook & Weeden Inc.
[illegible] McKinnon Securities Inc.
Sutro & Co.
Incorporated


"At Least They Could Have Asked Why You Brought That Along."

Small Firm Goes On-Line, Integrates WP and DP, Finds Needed Flexibility

PROVIDENCE, R.I. — [illegible] panies may have the [illegible] ized DP systems [illegible] sometimes need the [illegible] system incorpora[illegible] word processing (WP [illegible]

In trying to meet [illegible] F. Murphy & Co. [illegible] only to integrate its DP [illegible] tions, but also to [illegible] batch system to an [illegible]

Raymond F. Murphy [illegible] using computers in the [illegible] when it established [illegible] service bureau to handle [illegible] on a batch processing [illegible] added internal [illegible] counts receivable [illegible] a bigger system [illegible] processing mac[illegible] controller at R[illegible] Co., recalled [illegible] in 1974, we used [illegible] 12 hours a week [illegible] client service [illegible] balances, and [illegible] we were using [illegible] week, and [illegible] smaller firms [illegible]

While evalu[illegible] had seen a dem[illegible] Laboratories [illegible] multiapplica[illegible] puter. Wang [illegible] the capabili[illegible] and DP in [illegible] Integrated [illegible] At that time [illegible] ing a Wang [illegible] System [illegible]

Volpe adm[illegible] doubts abou[illegible] of the IIS [illegible] thinking [illegible] to turn my [illegible] tive compu[illegible] auditing ope[illegible]

R.F. Murph[illegible] Information [illegible] configuratio[illegible] processor [illegible] bytes of m[illegible] disk drive [illegible] lowercase [illegible] minals [illegible]

Direc[illegible]

The inte[illegible] auditor [illegible] the comp[illegible] ing syste[illegible] Murphy [illegible] balances [illegible] ally. Then [illegible] a DP spe[illegible] for input to [illegible] coded data [illegible] usually wer[illegible] run to con[illegible] was correc[illegible] and the audi[illegible]

In contrast [illegible] with the [illegible] does all his [illegible] minal itself [illegible] number and [illegible] puter immed[illegible] as he enters [illegible] developed [illegible] business [illegible] cost to [illegible] the job [illegible]

VT100
$1395

Firm[illegible] Geared [illegible]

Mainframe power.

Announcing the
3000 Series 44.

[illegible] computer supports everything
[illegible] the new HP 2680 Laser Printing System.
[illegible] of the computer in just 12-16 weeks.

Small system p

[illegible]

[illegible]

[illegible]ON-TO-PERSON SERVICE.

[illegible]ere really any other way to fix a computer?

[illegible]

And here's another promise: Every one of our representatives has the full weight of Honeywell behind him.

We have set up Technical Assistance Centers staffed by software, hardware, and installation experts.

Experts your representative can call on for fast, competent support.

That, in a nutshell, is our idea of person-to-person service.

Someone you know and rely on. Someone with the know-how and resources to do the job right.

At Honeywell we take service *personally.*

FIELD ENGINEERING HONEYWELL

Honeywell

In Medicare Claims Work

GAO Confirms EDSF Contract Violations

By Marcia Blumenthal

CW Staff

WASHINGTON, D.C. — The U.S. Government Accounting Office (GAO) has generally substantiated allegations that Electronic Data Systems Federal Corp. (EDSF) [illegible] contract with the Health Care Financing Administration (HCFA) in order [illegible] Medicare claims [illegible] backlog within acceptable [illegible]

The GAO report [illegible] Dec. 16, was the result [illegible] initiated last year [illegible] Simon (D-Ill.) [CW [illegible] 1979].

Specifically, the [illegible] EDSF, a subsidiary [illegible] Data Systems Co[illegible] possibly as many as [illegible] processed claims [illegible] mailroom in order to [illegible] of 150,000 claims [illegible] the end of 1979. EDSF [illegible] 173,000 claims [illegible] year end, but the [illegible] firm had between [illegible] 268,000 such claims [illegible]

The Health Care [illegible] ministration [illegible] penalties on the M[illegible] tractor in 12 catego[illegible]

[illegible]

IBM Continues Dip
In Revenue, Market Share

GREENWICH [illegible] IBM continued [illegible] market share [illegible] ping to 40.1% [illegible] 43.2% in 1978 [illegible] recently published [illegible] the top 100 DP [illegible] the Gartner Group [illegible]

The Gartner Gr[illegible] oped its report [illegible] industry [illegible] of information [illegible] the firm's data [illegible] significan[illegible] showed that [illegible] with total [illegible] $45.7 billion [illegible] from 1978 to [illegible] firms garnered [illegible] DP revenues [illegible] nies including [illegible] IBM's absol[illegible] top 100 DP [illegible] 31.6%, the report [illegible]

Mainframe [illegible] comprise [illegible] claiming [illegible] of the top 100 [illegible] though during [illegible] 1979 period [illegible] revenue [illegible] nies decreased [illegible] computer manu[illegible] the next lar[illegible] 13% of the total [illegible] top 100 [illegible] Gartner Group reported.

Severe Margin Pressure

On the whole [illegible] industry was under severe margin pressure during 1979, with 32 of the firms report[illegible]

[illegible]

TI Cuts Work [illegible]
Cites Softening of [illegible]

Demand for Minis

Ontrax Betting on Snug Niche for Disk Systems

[illegible] ... is dominated by small ... about $1.5 million ... Second- ... being ... esti- ... Snow [illegible]

[illegible] the 8-in. Mini Win- ... up to 126M ... Snow claimed ... capacity than Fu- ... [illegible]

Three-Part Market

[illegible] ... drive ... the three segments ... by the highly successful Shugart Associates. The mid-range group of companies produces 8-in. Winchesters in the 40M-byte to 60M-byte range and 14-in. Winchesters in the 160M-byte range.

Although many companies debate the possibilities of the high-end market, to date Fujitsu and Control Data Corp. and now Ontrax have made serious forays into this segment, Snow maintained.

However, Ontrax doesn't intend to confine itself to 8-in. disk systems. Within the next six to nine months the firm will introduce a 14-in. Winchester disk drive in the 550M-byte storage range, Snow said.

Although initially selling to the OEM market, Ontrax intends to pursue the more risky end-user market for its product — a strategy usually avoided by most mini disk drive makers.

Controller's 16 Cards

One reason the firm is opting for the end-user route is the controller developed for the disk product. While the controller for the current disk product uses four boards, Ontrax' controller has space for 16 cards. This design will allow a user to configure the controller as a CPU system that can be adapted for a variety of functions, Snow emphasized.

In designing its product, Ontrax developed and patented a head position actuator that requires no magnets. Ontrax uses two of these actuators in its 8-in. disk drive which, while not unusual in larger disk products, is unique to lower cost disk systems, Snow said. Moreover, the product can be adapted for use with thin-film technology, Snow said.

Although the firm is planning to sell its disk products to the end-user market, it has not yet set an end-user price, Snow noted.

On an OEM basis, in quantities of 250 to 500 units, the drive sells for $4,000 each and the basic controller costs $1,500.

Despite the power of an 8-in. Winchester system, its pricing is critical, Snow explained. With multiprocessing chips, such as Motorola, Inc.'s M68000, allowing a lot of power to be packed on a system for a low price, powerful peripherals must be priced relative to the processing unit, Snow noted.

The firm intends to set its end-user price for the 8-in. Winchester disk drive during the first part of 1981.

Aside from pricing, the major hurdle of serving the end-user marketplace will be establishing a sales and service organization.

Introducing the IPL 4400 Series:

The fastest 4300 on the market today.

today.

SYSTEMS INC.

Memorex Forms Sales Group

CUPERTINO, Calif. — Memorex Corp.'s Communications Group announced the formation of a sales force [illegible] communications products and appointed five regional [illegible] this effort.

[illegible] Communications Group [illegible] 1300 screen [illegible] 1277 [illegible] 2076 display stations, 2076 [illegible] cluster controller, [illegible] 1270 [illegible] controllers, 2080 [illegible] 1270 [illegible] control [illegible] processor [illegible]

[illegible] regional [illegible] Hoit, Western; [illegible] Central; Steve [illegible] Eastern [illegible]

The [illegible] representatives [illegible] of Memorex [illegible] the U.S. Memorex International will continue to sell and service Memorex Communications products outside the U.S., a spokesman said.

The Zenith Smart Terminal

Compare the features

Reverse video [illegible] by character [illegible] can be used to emphasize words, lines, phrases or paragraphs.

Underline [illegible] reverse [illegible] blinking [illegible] is adjust[illegible] to allow [illegible] edit [illegible] on the [illegible] screen.

80 [illegible] 24 lines [illegible] plus [illegible]

[illegible]

Then compare the price

For [illegible] the Zenith [illegible] terminal is a very [illegible] buy. It [illegible] with almost all commonly available [illegible] systems and provides the most advanced [illegible] features for data entry, editing, inquiry and transaction processing — wherever you need a top-of-the-line, general-purpose terminal.

The Z19 is ideal for high speed data entry. The 12" diagonal CRT gives you a crisp, clear video image. And the Z19's keyboard follows the standard typewriter keyboard layout for operator ease. Along with this you get ANSI and DEC-VT52 compatibility. And one other [illegible]

DEC [illegible]

[illegible]

800-[illegible]-3600 [illegible]

ZENITH | data systems

The quality goes in before the name goes on

Burroughs, Univac Win Air Force Contracts

[illegible] undertake to convert the Air Force's [illegible] Univac and [illegible] pro- [illegible] modern computer equipment, the transition of existing computer programs to operate on the new equipment, and result

Orders & Installations

[illegible] their [illegible] After [illegible] demon- [illegible] transi- [illegible] their [illegible] base-level [illegible] will [illegible] 1983 to [illegible] 150 mod- [illegible] for the

[illegible] Concept

[illegible]

in the delivery of an integrated ready-to-operate base-level computer system.

Ultimately, the new computer system will be installed at 115 Air Force installations around the world to meet individual base level DP requirements, a spokesman said.

After Phase IV computer systems are installed they will allow commanders and managers to more efficiently employ and support complex weapons systems such as the F-15 and F-16 tactical fighters. These computers will support essential weapons systems maintenance and supply activities and permit more effective management of personnel financial engineering and equipment resources throughout the Air Force.

Overdue Replacement

Colonel Dale Seastrom, Phase IV program manager, summarized the program as "a long overdue replacement of two expensive to operate and out-of-date computer systems."

When it becomes fully operational in 1985, Phase IV will provide the Air Force with an integrated base-level DP capability to meet user needs into the 1990s and provide the potential for expansion of individual Phase IV computers to accommodate additional requirements through the remainder of this century," he said.

Other Awards

Informatics, Inc. has been awarded a two-year $680,000 contract from the U.S. Air Force's Rome Air Development Center. The terms of the agreement call for Informatics' support of the Air Force Intelligence Service's Common Users' Baseline for the Intelligence Community program (Cubic).

Interaction Systems Inc. has received an order for 1,000 of its Model TT-100 touch-sensitive CRT terminals from CL Systems Inc. The order is valued at between $2 million and $3 million.

MAP Array Processors, products of CSPI, Inc., have been ordered by the Ford Motor Co. for production-line engine test stations.

The National League of Cities has purchased a Local Government Financial System (LGFS) including a Digital Equipment Corp. PDP-11 minicomputer from American Mangement Systems Inc.

Nickels & Dimes

Digital Equipment Corp. [illegible] additional shares will be distributed Dec. 19 to stockholders of record Dec. 1.

$$$

Tesdata Systems Corp. has reported it earned a profit exceeding $1 million on an [illegible] transaction. The [illegible] 60 cents per share [illegible] formally announced [illegible] 1980.

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Distributor Awarded Nearly $600,000

Adds Loses Suit Charging Unfair Compe[illegible]

By Jeffry Beeler
CW West Coast Bureau

OAKLAND, Calif. — A former distributor of Applied Digital Data Systems Inc. (Adds) CRT terminals has been awarded damages totaling nearly $600,000 in a lawsuit charging Adds with knowingly supplying defective products and unfairly competing with that distributor for a key sales order.

The suit — which was [illegible] about two years ago [illegible] Consolidated Data Terminal [illegible] (CDT) — was decided [illegible] when a U.S. District [illegible] judge here ruled th[illegible] knew about but fa[illegible] rect long-standing [illegible] Regent 100 and 200 [illegible]minals.

The court also fo[illegible] terminals were [illegible] represented [to CDT [illegible] herently reliable [illegible] they were "neg[illegible] signed and routine[illegible] meet performance [illegible] tions.

Intel Bid

In addition, the [illegible] cluded that A[illegible] "wrongfully interfe[illegible] CDT's efforts to [illegible] 1978 end-user sal[illegible] Intel Corp.

Although the court [illegible] reaffirmed Adds' [illegible] compete with its distributor [illegible] for the same order, the judge questioned the defendant's bidding practices in the Intel deal.

The original round of [illegible] ding [illegible] order [illegible] standard end-user pri[illegible] [illegible] CDT [illegible]

Conta[illegible]

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W. Michael Blumenthal, chairman and chief executive of Burroughs Corp., announced that the company will endow a new fellowship at New York University's Graduate School of Business Administration as one of its regularly scheduled contributions to educational institutions.

[illegible] has [illegible] agreement with [illegible] Industries [illegible] construction [illegible]

[illegible] Association [illegible] Master [illegible] installed the [illegible] system [illegible] software pack- [illegible]

[illegible] authori- [illegible] Marketing [illegible] Series [illegible] IBM computer distrib- [illegible]

[illegible] Management Sys- [illegible] manage- [illegible] has [illegible]

[illegible] Prod- [illegible]

[illegible] communica- [illegible] throughout [illegible]

[illegible] Computer [illegible] Inc. [illegible] regional cus- [illegible] center in Oak [illegible] that [illegible]

[illegible] F. Herriott, head of [illegible] Graphic Systems Development Department of Bell Laboratories in Murray Hill, N.J., is [illegible] of the Institute of [illegible] and Electronics Engineers (IEEE) for 1981. [illegible]

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New Companies

Power Data Systems, Inc. has been established to market and sell hardware and software to the electronic information processing industry specializing in communications networking and multitasking systems. Its headquarters are at 160 New Boston St., Woburn, Mass. 01801.

Creative Management Concepts, Inc. was incorporated to provide management consulting services to small and medium-sized businesses specializing in information processing management and business information systems. They are located at 836 Taylor Ave., Kirkwood, Mo. 63122.

Kislowski & Co. has been formed to provide consulting services in systems communications and computer operations for the retail and distribution industries. It is located at Suite 217, 1100 Quail St., Newport Beach, Calif. 92660.

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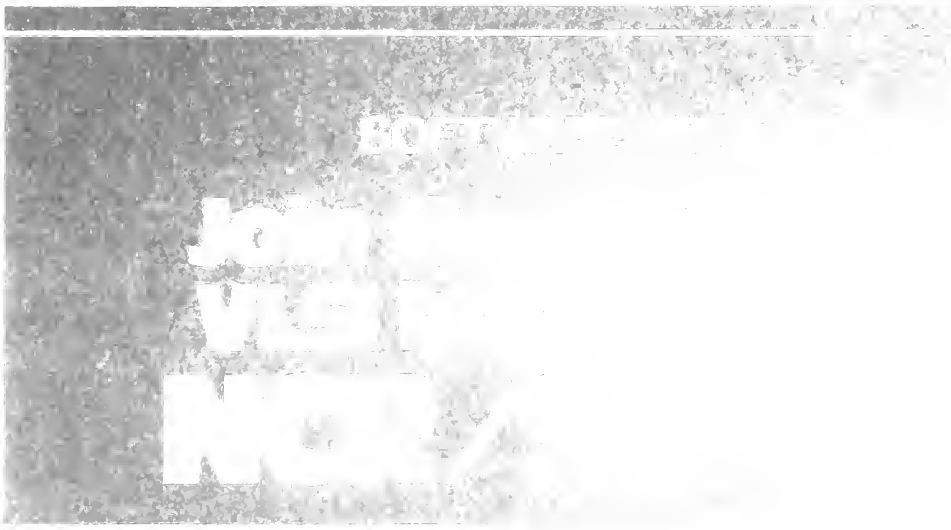
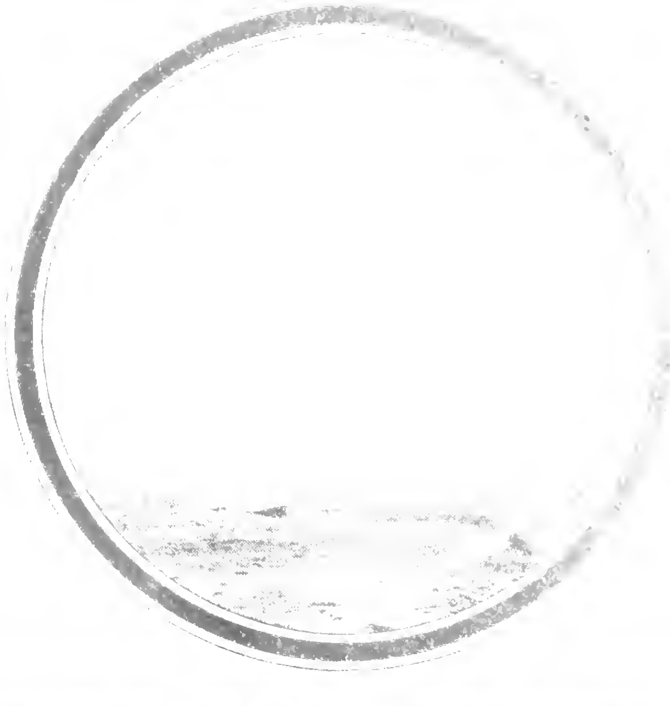


The challenge...

[illegible]

- Creating [illegible]
- Designing [illegible] evolving OS [illegible]
- Increasing [illegible] multi-processing [illegible]
- Applying large [illegible] concepts to [illegible]
- Implementing [illegible] program of [illegible] and diversity
- Designing a T[illegible] System of the [illegible]
- Performance [illegible] monitoring



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[illegible]

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[illegible] large-scale [illegible] make integrated use [illegible] workloads for [illegible] purposes. [illegible] modeling techniques for [illegible] large-scale and minicom[illegible] of these system[illegible]

[illegible] evaluation of Data Base [illegible] capabilities and system [illegible] in the selection of [illegible] performance prototyping is [illegible]

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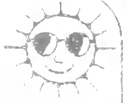

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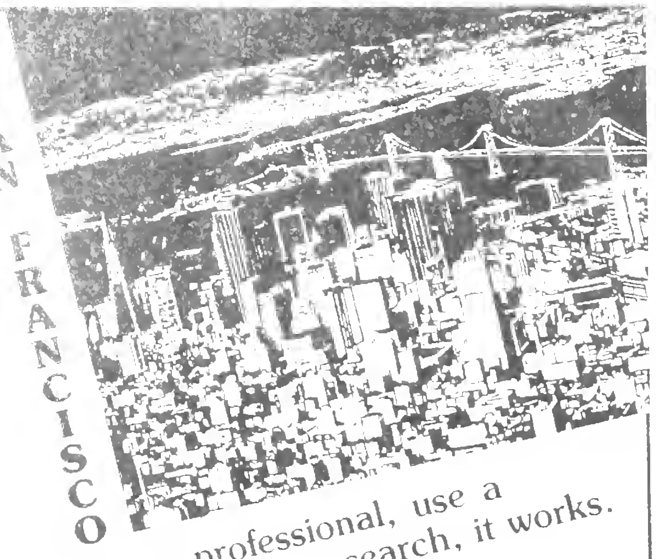

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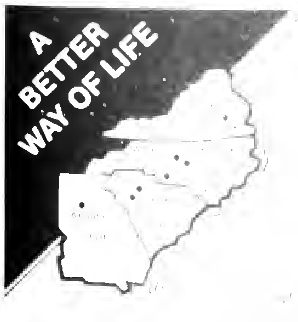

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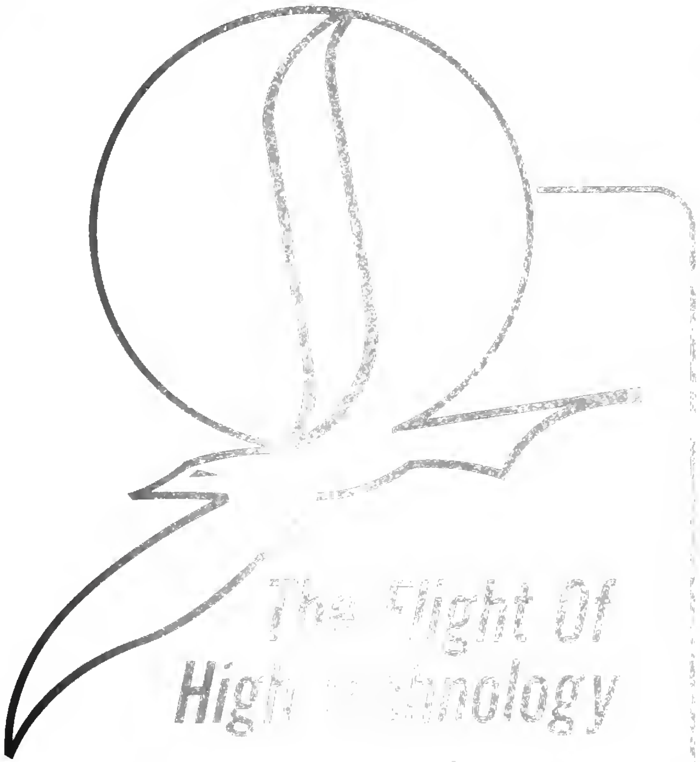

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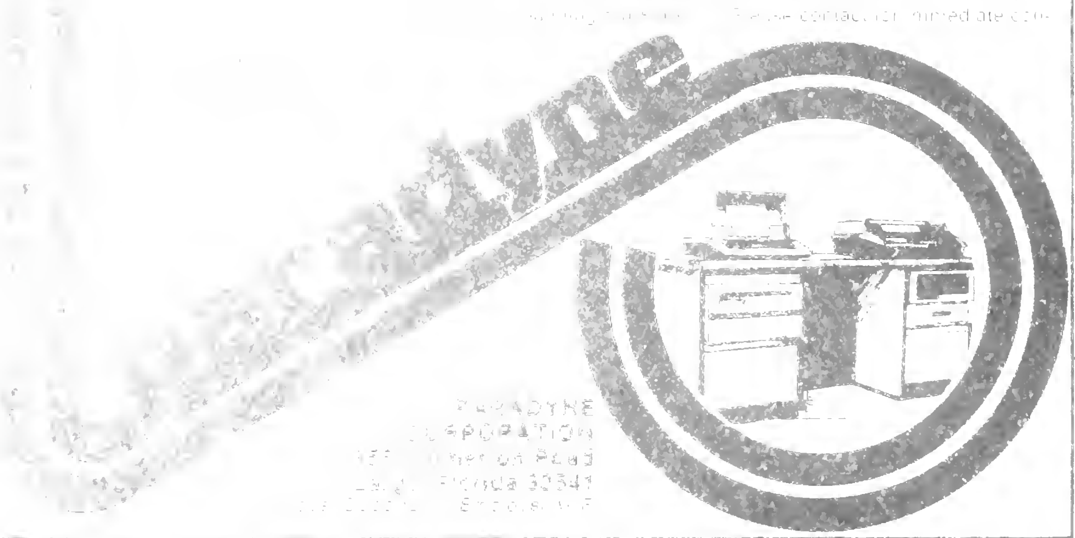

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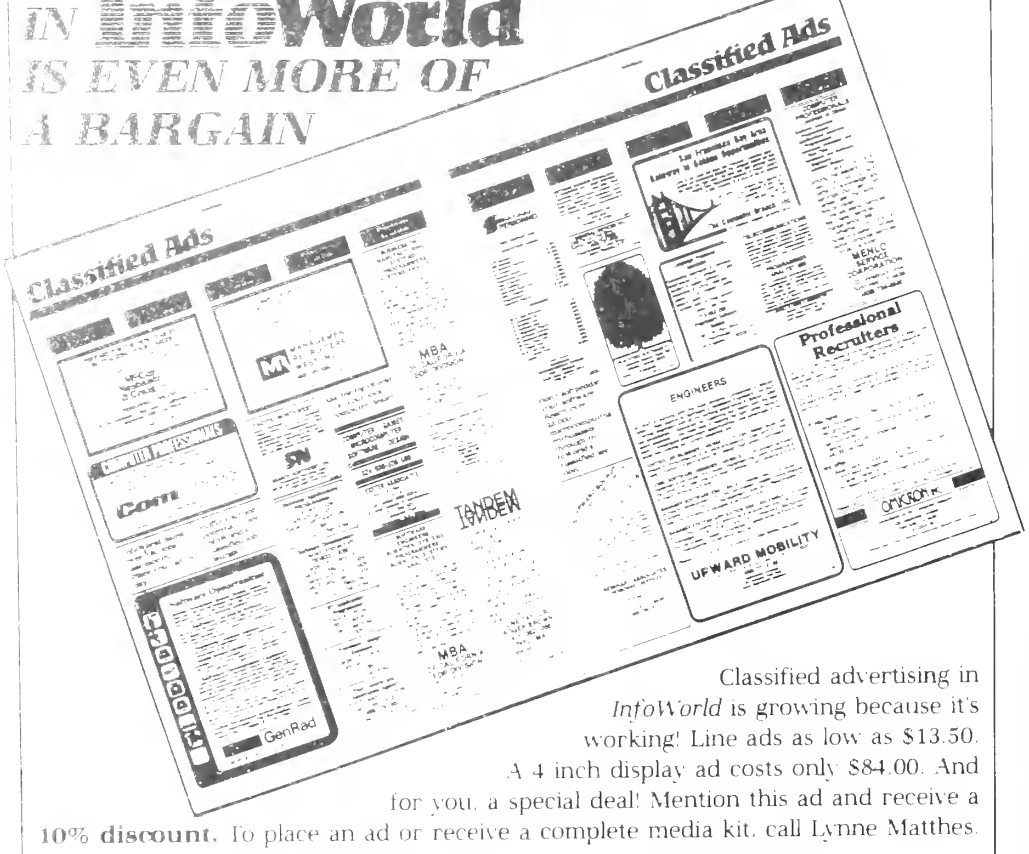

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[illegible] compensation package, relocation [illegible] opportunity, and outstanding [illegible] community with excellent [illegible] Sounds good, doesn't it?

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[illegible]

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[illegible] computer professionals [illegible]

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DP [illegible]

[illegible]

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Syracuse, N.Y. 132[illegible]
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[illegible]

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[illegible]

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COMPUTER

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[illegible]

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Assistant Professor of Computer Science. Ph.D. in Computer Science or a closely related field. Graduate and undergraduate degrees offered. Major [illegible] data base management [illegible] data communications [illegible] graphics systems [illegible] language processing [illegible] operating systems. **Send resume by March 1, 1981 to H.L. Henry, Associate Dean of Engineering, Louisiana Tech University, Ruston, Louisiana 71272.**

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The department seeks candidates in the broad area of:

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Candidates should have a Ph.D. degree in Computer Science and will be expected to contribute to an ongoing program of research and teaching at both the undergraduate and graduate levels. Rank and salary are dependent upon qualifications. Applications will be accepted as long as the positions remain open.

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SKI NH

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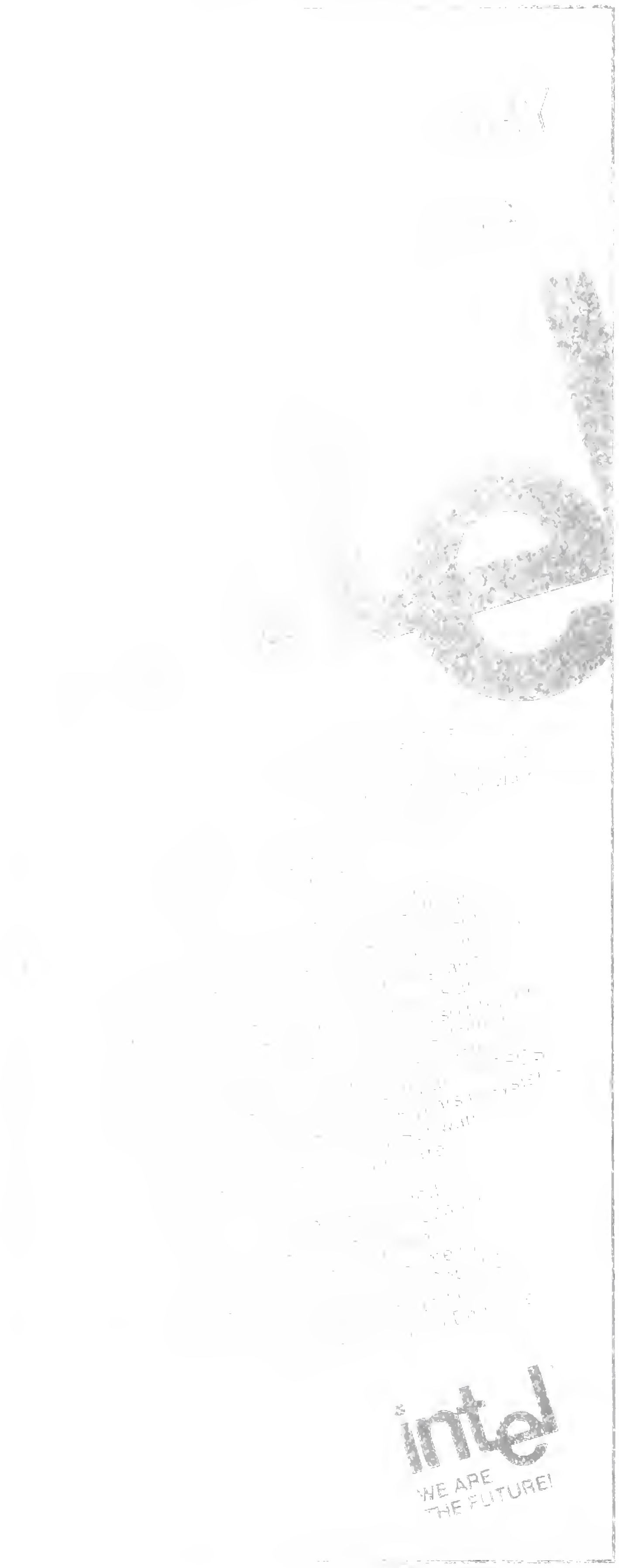

[illegible]TUNITIES

[illegible]

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[illegible]

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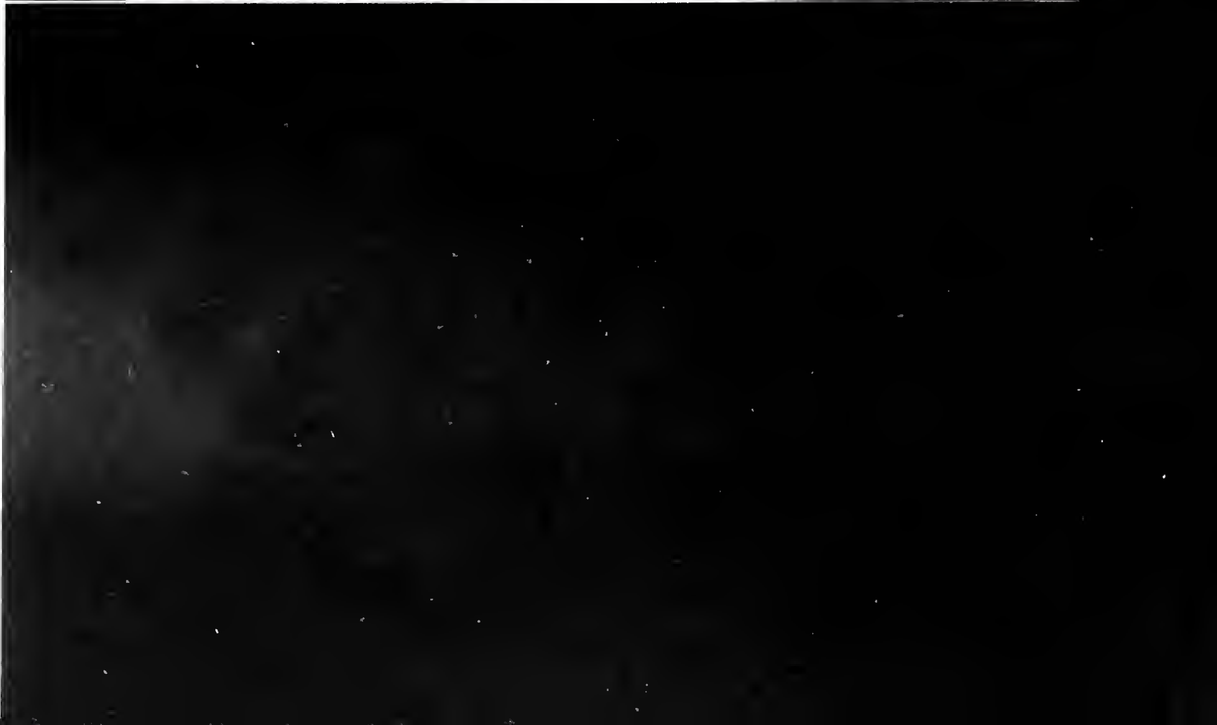

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FOR [illegible]

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4341
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Delivery Positions
Joe Romeo

4331
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Joe Romeo

SYSTEM 3
Models
12 and 15
Dennis Pennington

SYSTEM 34
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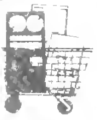

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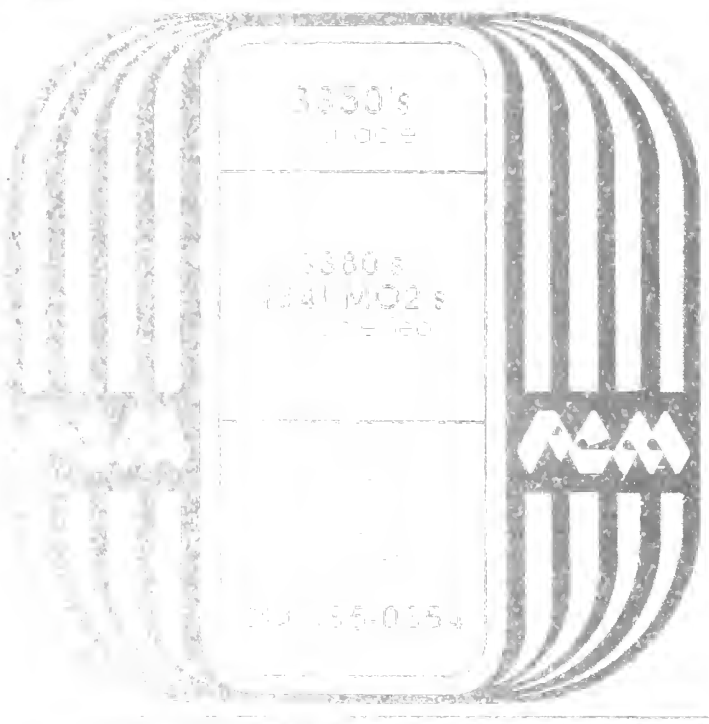

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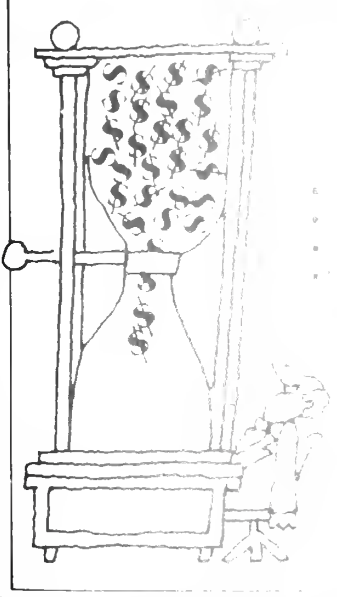

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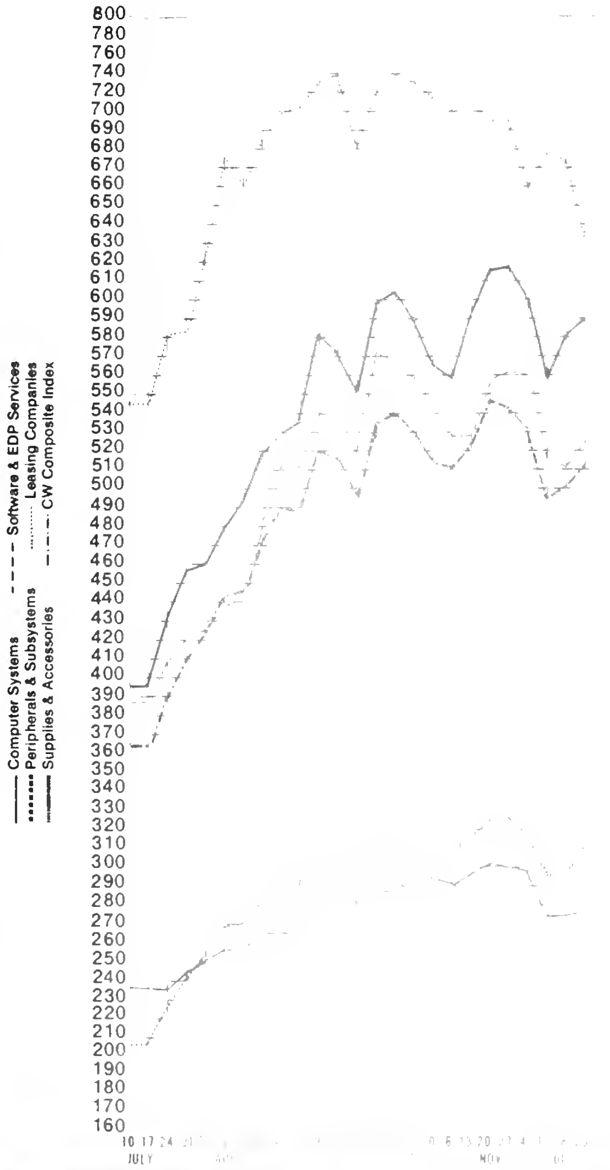

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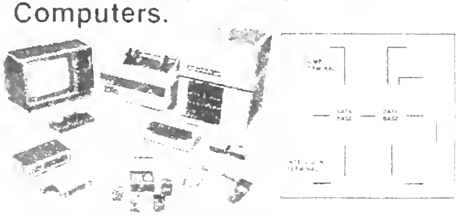

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